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Foreign Direct Investment and Sectoral Performance in Tanzania

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Abstract. Although it may seem natural to argue that Foreign Direct Investment (FDI) can bridge the investment gap in developing countries' economy, which in turn foster economic growth, this paper shows that the effects of FDI vary greatly across sectors. In fact, there is a lack of systematic evidence on the actual impact of FDI on the host country. An empirical analysis using time series data spanning from 1970 to 2015 and applying Error Correction Mechanism, suggests that FDI exerts a negative effect on agriculture value added. Unsurprisingly, FDI tends to have a positive effect on manufacturing, construction and transport, storage and communication sectors. Evidence from the mining sector is not clear despite the fact that the sector constitutes a substantial proportion of FDI inflows. The unexpected negative causal relationship between FDI inflows and agricultural sector in Tanzania could be because of the low level of FDI in the sector relative to other sectors. However, it is possible for FDI to be contributing to the GDP through manufacturing, construction and transport, storage and communication sectors and yet not increasing the welfare of the people in the country. Agricultural sector, which constitutes more than 70 percent of the total labour force, contributes, on average, less than 30 percent, in total GDP. Understandably, FDI in the agricultural sector can improve the welfare in the country than FDI in mining and manufacturing sectors. Given the importance of the subject, it is surprising to find that very little effort has been devoted to quantifying the sources of agricultural decline.
Keywords. FDI, Sectoral composition, Agricultural sector, Mining sector and Manufacturing sector.
JEL. F23, F36, F43

1. Introduction

It is widely accepted that FDI has a significant role to play in national development strategies and is viewed as the engine with which to exploit and sustain the competitiveness of resources and capabilities mainly through economic liberalization doctrine. Proponents of FDI argue that FDI plays a significant role in increasing productivity by offsetting the investment and technological gap (Chen & Démurger, 2002; FAO, 2001; and Buckley *et al.*, 2006). It also contributes to improved transfer of technology and skills (Kabelwa,

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2003, 2004; IMF, 2001) which in turn improve efficiency and economic growth (Blomström & Kokko, 2003). According to IMF (2001), FDI promotes economic growth through raising technological levels, creating new employment opportunities and offering a source of external capital in developing countries. Similarly, Nyankweli (2012) points out that the effect of FDI on the economy includes enhancing the inflow of external resources. In general, FDI has become an important force in both low income and high income economies because of its impact on economic and socio-cultural development as well as livelihoods (Luvanga & Shitundu 2003; UNCTAD 2003, 2004).

Likewise, it is shown that FDI works as a means of integrating developing countries into the global market place and increasing the capital available for investment which in turn lead to increased economic growth required for poverty reduction and improvement in living standards (Rutihinda, 2007; Dollar & Kraay, 2002, Dupasquier & Osakwe, 2005). Indeed, policy makers and governments encourage multinational enterprise (MNE) activity as a source of capital and technology and believe that inward FDI flows fill the savings, investment, and production gaps in less developed countries. As a result, FDI is regarded as a means to alleviate resource and skill constraints (Noorbakhsh *et al.*, 2001) through the application of ownership-specific advantages in the form of financial, human resources, technology and knowledge (Dunning, 1993).

During the past 20 years there has been a marked increase in both the flow and stock of FDI in the world economy. For example, FDI flows to developing economies increased by 2 per cent to a historically high level in 2014, reaching US$681 billion (UNCTAD, 2015). In Tanzania**,** with the initiation of economic reforms in 1986, investment interest in the country has grown considerably in all sectors. During the 1995-1998 period, FDI flows were 3.6 times as much as the magnitude registered in the 1970-1994 period. Certainly, the mid 1990s have been characterised by a strong momentum in the economic reform process. FDI net inflows as percent of GDP in the country was, on average, 3 percent of GDP during the 2004-2014 period (Epaphra & Massawe, 2016). Its highest value over the past 20 years was 5.2 in 1999, while its lowest value was 0.2 in 1998. In recent years, the value of FDI inflows increased from US$ 2130.9 million in 2013 to US$ 2141.6 million in 2014. Also, FDI stocks rose to US$ 17013.4 million in 2014 from US$ 14871.8 in 2013, equivalent to an increase of 14.4 percent, despite the fact that the global FDI inflows in 2014 fell by 16 percent, mostly because of the fragility of the global economy, policy uncertainty for investors and elevated geographical risks (UNCTAD, 2015). The current increase in FDI in Tanzania mainly is due to gas discoveries. Meanwhile, during the 2008-2014, South Africa, the United Kingdom and Canada accounted for an average of 70 percent of the total FDI inflows to Tanzania implying that the sources of FDI inflows is inadequately diversified, thus exposing the country to risks emanating from external shocks (Epaphra & Massawe, 2016).

Understandably, between 2000 and 20014, Tanzania had one of the strongest growth rates of the non-oil-producing countries in Sub-Saharan Africa. During that period, annual real GDP growth was, on average, 6.6 percent, with 7.2 percent in 2014 (World Bank, 2015). However, per-capita GDP averaging US$ 881.3 over the 2011-2015 period is far from the projected US$ 3,000 by 2025. Indeed, to achieve a status of a middle income country by 2025, Tanzania economy is supposed to grow at about 10 percent per annum. Agriculture, which accounts for the largest share of total labour force records low levels of investment expenditure. For example, the annual FDI inflows to agriculture are lower than that of mining and quarrying and manufacturing which account for 3.4 percent and 8.2 percent share in GDP respectively (Epaphra & Massawe, 2016). As a result, up until 2007, the poverty rate in Tanzania remained stagnant at around 34 percent of the whole population despite a robust growth at an annualized rate of approximately 7 percent. A huge percent of population living below the standard poverty line is that of small scale farmers leaving in rural areas. Thus, growth in agriculture and its productivity are considered essential in achieving sustainable growth and significant reduction in poverty in developing countries. Undoubtedly, limited development and adoption of new production technologies essential for improving productivity by the poor are mostly due to limited income and sources of credit. To this end, FDI is expected to play a significant role in increasing productivity by offsetting the investment and technological gap as it comes with improved technologies.

In spite of noticeable impact of FDI on economic growth, however, the FDI flows by activity raise a number of questions at the core of using FDI as a driver of sustainable growth, employment and poverty reduction. During the 1998-2014 period, FDI flows to agriculture, hunting and forestry which employed about 70 per cent of the labour force and contributed 25 percent to GDP was, on average 1.3 percent of total FDI flows while mining sector that employed less than 1 percent of the labour force and contributed 3.4 percent to GDP had 30.5 percent share in total FDI flows during the same period. In fact, the flows of FDI to agriculture sector are less than that of manufacturing and electricity and gas sectors. As a result, Tanzania's exports tend to shift from traditional commodities such as coffee, cotton, sisal, tea and tobacco towards non-traditional products such as minerals, gold in particular. This means that the use of FDI in attaining sustainable employment, economic growth and poverty reduction would have substantial effect on the performance of the whole economy. This paper therefore examines the impact of FDI on various sectors of the economy such as agriculture, hunting, forestry, fishing (ISIC A-B), mining (ISIC C), manufacturing (ISIC D), construction (ISIC F) and transport, storage & communication (I) in Tanzania. The choice of the sectors mainly was due to their importance in the economy and availability of time series data. This is very significant because previous studies, for example, Alfaro (2003) concludes that the contribution of FDI to growth depends on the sector of the economy where the FDI operates. He claims that FDI inflow to the manufacturing sector has a positive effect on growth whereas FDI inflow to the primary sector tends to have a negative effect on growth while its effect on services sector is not so clear.

The paper uses time series data spanning from 1970 to 2015. The justification of this paper is based on the assumption that good performance of FDI is reflected in growth of the host country and improvement in the living standards of its people. This is largely contributed to improvement in sectoral performance and one of them being agriculture which employs more than half of the total working class and its contribution in GDP is substantial.

2. Nature of the Economy and Sectoral Distribution of Foreign Direct Investment

2.1. Macroeconomic Performance

During the 1970-2015 period, the Tanzanian economy experienced mixed performance. Real GDP growth, inflation, real exchange rate and FDI have been characterized by fluctuations, partly a result of economic policies pursued by Tanzania under a public sector-led economy embedded in the 1967 Arusha Declaration, and partly a result of exogenous factors, including deterioration in the terms of trade in the late 1970s and early 1980s, the collapse of the East African Community in 1977, and the war with Uganda's Iddi Amin during 1978-1979. The fall in the prices of exports such as sisal, tea and cotton and the rise in price of imports such as oil crisis of 1973-1974 and oscillating currency exchange rates also contributed to these fluctuations. However, during the last decade, economic performance has remained stable and strong. For example, the annual mean of real GDP growth increased from 6.1 percent during the 2006-2010 period to 6.9 percent during the 2011-2015 period despite the fact that inflation rose from annual mean of 8.6 percent during 2006-2010 period to 9.7 percent during the 2011-2015 period (Table 1). Nonetheless, over the past few years, inflation has stabilized at single digits, declining from an annual rate of 34 percent in 1994 to 5.6 percent in 2015 mainly due to prudent fiscal and monetary policy measures. Overall performance of macroeconomic variables including trade, gross fixed capital formation, FDI and tax revenue during the 2011-2015 period was stable. Indeed, annual mean of tax revenue-to-GDP ratio rose from 9.1 percent during the 2001-2005 period to an annual mean of 11.8 percent over the 2011-2015 period.

Table 1. *Selected Economic Indicators, 1970-2015*

	1970-1975	1976-1980	1981-1985	1986-1990	1991-1995	1996-2000	2001-2005	2006-2010	2011-2015
pGDP, US$	231.0	413.7	545.0	292.7	256.8	366.7	424.5	604.7	881.3
Growth	4.7	2.9	1.1	3.9	4.0	4.2	7.1	6.1	6.9
GFCF	41.7	40.6	21.0	20.4	27.7	20.9	24.8	37.3	42.6
RER	723.5	579.5	409.9	1235.7	1624.6	1164.4	1435.0	1475.6	1299.4
TL	46.9	37.1	21.2	28.8	42.2	24.2	27.6	44.9	51.8
π	12.0	13.6	30.2	31.1	27.5	12.7	5.1	8.6	9.7
Population	3.2	3.1	3.1	3.1	3.2	2.6	2.8	3.1	3.2
FDI	0.1	0.1	0.1	0.0	0.6	2.1	3.1	3.8	4.3
Tax Revenue	18.2	17.9	16.4	10.2	10.0	9.4	9.1	9.8	11.8
Expenditure	24.65	26.8	26.1	12.0	13.6	11.9	16.0	17.2	18.5

Notes: pGDP: real per capita GDP; Growth: real GDP annual growth rate; GFCF: gross fixed capital formation, percent of GDP; RER: real exchange rate; TL: exports plus imports, percent of GDP; π: Inflation; POP: population growth rate; FDI: foreign direct investment; Tax revenue-to-GDP ratio; Government expenditure-to-GDP ratio.

Source: computed using data from World Bank and Bank of Tanzania (Various issues)

The strong economic performance in recent years was driven mainly by construction, information and communication and wholesale, retail trade, restaurants and hotels sectors (Table 2). The construction activity grew by 14 percent in 2015 (BoT, 2014) and accounted for an annual mean of 10.9 percent of GDP over the 2011-2015 period (Table 2). The improved performance of construction activity was attributed to construction and rehabilitation of bridges, buildings, road network, airport, as well as acquisition of ferries (BoT, 2015). The value added of transport, storage and communication as percent of GDP rose from annual mean of 8.1 percent over the 2006-2010 period to annual mean of 9.4 percent during the 2011-2015 period reflecting increased number of mobile phone subscribers and internet users, as well as investment resulting from technological innovations (BoT, 2014). Cargo handling at Dar es Salaam port also improved owing to measures implemented to reduce time for cargo clearance. This supportive physical infrastructure and a favourable business environment represent important pre-requisites for FDI-led industrialization.

Table 2. *Value Added, Percent of GDP (2005 Prices), 1970-2015*

Sector	1970-1975	1976-1980	1981-1985	1986-1990	1991-1995	1996-2000	2001-2005	2006-2010	2011-2015
ISIC A-B	29.63	27.52	28.62	30.94	33.00	32.59	30.20	26.86	23.89
ISIC C-E	12.43	12.15	10.29	8.98	9.19	9.75	11.14	11.49	11.45
ISIC D	10.37	10.50	8.00	6.85	6.80	6.69	6.96	7.89	8.06
ISIC F	4.82	3.64	2.85	3.64	6.05	6.39	7.30	9.26	10.91
ISIC G-H	13.71	11.93	11.00	11.52	11.09	11.03	11.20	11.67	11.85
ISIC I	9.07	8.84	7.70	7.06	7.10	7.35	7.45	8.09	9.42
ISIC J-P	19.97	25.40	31.54	31.01	26.76	26.20	25.76	24.75	24.42
TVA	100	100	100	100	100	100	100	100	100

Notes: ISIC A-B: Agriculture, hunting, forestry, fishing; ISIC C-E: Mining, manufacturing, utilities; ISIC D: Manufacturing; ISIC F: Construction; ISIC G-H: Wholesale, retail trade, restaurants and hotels; ISIC I: Transport, storage & communication; ISIC J-P: Other Activities.
Source: Computed using data from United Nations Statistics Division (2016)

Along with economic reforms and recovery that started in 1986, priority spending aimed at promoting high economic growth and improving social services was channeled to investment in socio-economic sectors such as infrastructure, agriculture, health and education. As a result reforms were supported by large inflows of foreign aid and technical assistance. In particular, FDI inflows-to-GDP ratio rose from 0.01 percent over the 1986-1990 period to 4.3 percent during the 2011-2015 period. Also, during the same period the degree of openness increased from 28.8 percent to 51.8 percent after several years of fluctuation chiefly due to policy changes (Table 2). During the early period of reforms and recovery macroeconomic stability was not achieved mainly due to the government's inability to control credit expansion to public enterprises, massive tax exemptions, poor revenue collections, and tax evasion. In the 1980s and early 1990s economic performance was extremely weak, with growth in GDP often less than the growth in population.

Similarly, export performance remained strong in the recent years, driven by gold and tourism receipts (BoT, 2015). This also implies that the country does not only attract FDI but also it engages in outward investment in foreign markets. Besides, exportation has a relatively low-risk to enter a foreign market because it does not involve actual presence in the target market (Shenkar, 2007). Nevertheless, exporting does not enable firms to maintain control over foreign production and operations.

2.2. *Sectoral Distribution of Foreign Direct Investment*

The World Investment Report (2015) shows that in 2014, the top five FDI recipients were Mozambique with US$4.9 billion, Zambia with US$2.5 billion, the United Republic of Tanzania with US$2.1 billion, the Democratic Republic of the Congo with $2.1 billion and Equatorial Guinea with $1.9 billion. These five countries accounted for 58 per cent of total FDI inflows to LDCs reinforced by the export specialization of these countries (UNCTAD, 2015). Indeed, FDI inward stock in Tanzania in 2014 was as much as US$ 17 mainly due to gas discoveries and mineral exports. In the same line, improved macroeconomic performance, political stability and market liberalization since the second half of 1990s have led to a surge in investor interest and have encouraged the inflow of foreign capital.

During the 1980-2015 period, the FDI inflows and stocks have increased steadily (Figure 1). This FDI performance has followed the developments in the political economy, reflecting the wide spread economic liberalization, Mineral Policy of 1997, enactment of the Mining Act of 1998, the Mining Act of 2010, the Investment Policy and Act of 1997 and other promotional efforts by Government. Indeed, in the second half of the 1990s, FDI grew much faster than the economy. The share of FDI stock as a percent of GDP reflects the importance of FDI activity in the country's productive process and shows the potential impact of FDI stock (Portelli, 2005).

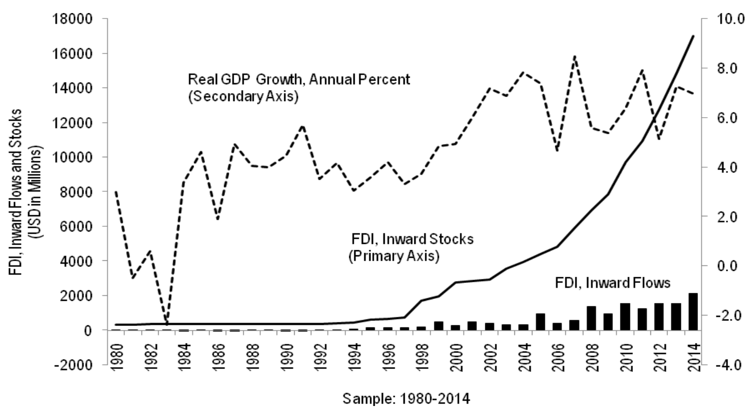

Figure 1. *Real GDP Growth, FDI, Inflows and Stocks*
Source: Computed using data from UNCTAD, WIR (2015)

Tanzania also compares well to its regional African neighbours in terms of total FDI inflows and stocks[1] reflecting investment in tourism infrastructure/hotels and mining exploration (URT, 2014) (Tables 3 and 4). This also highlights the importance of foreign investment in total investment for the Tanzanian economy. According to (UNIDO, 2003), Tanzania is gradually assuming a front-runner position in attracting foreign investment in SSA. Indeed, FDI is now considered as an important input for development of the economy. It brings scarce capital needed in the economy that has large current account deficits. It also brings new technology and managerial knowhow to enhance growth and productivity (Kinoshita, 2011). FDI in the nontradable sectors boost current account deficits without contributing to an expansion of export earning capacity while FDI in the tradable sector is associated with higher exports (Kinoshita, 2011). Understandably, economic growth is an essential condition for poverty reduction in Tanzania.

[1] The flow of FDI means the amount of FDI undertaken over a given time period (e.g. a year). The stock of FDI means the total accumulated value of foreign owned assets at a given time (which takes into account possible divestment along the way).

Table 3. *FDI, Inward Flows (USD Millions)*

Economy	1980-85	1986-90	1991-95	1996-00	2001-05	2006-10	2011-14
Burundi	3.56	1.18	0.79	2.22	0.13	1.10	10.68
Kenya	28.24	38.36	12.82	39.94	36.39	233.67	521.96
Rwanda	15.99	15.88	3.58	4.35	8.07	116.88	224.85
Uganda	0.34	-0.59	54.25	143.34	242.71	710.17	1085.56
Tanzania	8.07	0.33	46.40	251.42	485.82	1026.73	1825.36

Source: UNCTAD, WIR (2015)

Table 4. *FDI, Inward Stocks (USD Millions)*

Economy	1980-85	1986-90	1991-95	1996-00	2001-05	2006-10	2011-14
Burundi	18.52	28.08	31.99	37.00	46.93	3.49	20.26
Kenya	426.37	576.90	701.05	819.54	1030.83	1886.52	3310.95
Rwanda	0	6.53	45.55	56.98	64.42	269.36	788.51
Uganda	11.60	9.87	102.27	568.24	1425.46	4185.19	8208.21
Tanzania	369.98	382.87	459.4	1585.22	3557.98	7066.70	13891.86

Source: UNCTAD, World Investment Report (2015)

FDI in Tanzania originates from a wide range of countries. The Tanzania Investment Report (2013) shows that the top six source countries for FDI stock in 2012 were United Kingdom, Canada, Switzerland, USA, South Africa and Kenya. These countries accounted for US$ 786.9 million, US$ 308.8 million, US$ 219.4 million, US$ 198.9 million, US$ 148.3 million, and US$ 108.7 million respectively. In 2012, Inflows from South Africa, United Kingdom, Barbados, Canada and Kenya reached US$ 7,423.5 million, equivalent to 58.2 percent of the total stock of FDI (Tanzania Investment Report, 2013). This also implies that in Tanzania, FDI originates from few source countries. FDI flows to Tanzania are categorized into market-seeking FDI, for example, investment in manufacturing of beer, cement and sugar; export-oriented FDI for example investment in mining and textile and FDI in infrastructure and utilities such as energy, port and telecommunication.

Table 5 reports the flows and stocks of FDI by activity over the 2008-2012 period in Tanzania. In fact, the sectoral distribution of FDI inflows and stocks has been very different among the sectors. The country has experienced FDI inflows upsurge in the mining and manufacturing sectors with relatively low inflows in other key sectors of the economy such as agriculture. Mining and manufacturing sectors account for more than 60 per cent of total FDI stock. Significantly, Tanzania is one of Africa's most mineral-rich countries. The country is endowed with mineral deposits of high economic potential including metallic minerals such as gold, iron, silver, copper, platinum, nickel and tin; gemstones such as diamonds, tanzanite, ruby, garnet, emerald, alexandrite and sapphire; industrial minerals such as kaolin, phosphate, lime, gypsum, diatomite, bentonite, vermiculite, salt and beach sand; building materials such as stone aggregates and sand; and energy minerals such as coal and uranium (URT, 2015). Melerani is the only place in the world with natural Tanzanite while Mwadui is the largest kimberlite pipe in the world where diamond is being mined. Political stability of the country since its independence in 1961 provides protection to investors and abundance of mineral resources attracts explorations and investment. As a result, FDI flows and stocks into mining sector increased rapidly from US$ 385.1 million and US$ 3714.1 million in 2009 to US$ 889.3 million and US$ 6304 million in 2012 respectively. FDI flows into the mining industry averages US$ 460 million per annum. Much of the FDI in the mining sector, the largest single sub-sector in terms of FDI has been the gold mining industry.

As it has been expected, mining contribution to GDP, employment, production and export of minerals have increased. For example, export earnings from mineral export increased from an average of 1 percent of total export in 1997 to 52 percent in 2013 (URT, 2015)[2]. Similarly, the contribution of mining to the GDP rose from less than 1 percent in 1997 to 3.5 percent in 2013. Also, direct employment in the large scale mining industry increased from 1,700 to 15,000 in 2013.

Manufacturing also constitutes a large share of both FDI inflows and stocks. For example, during the 2008-2012 period, FDI inflows and stocks in this sector were, on average, 20 percent and 14 percent of total FDIs (Table 5). The fact that industrial development has been an integral part of Tanzania's development strategies in the post-independence era (Wangwe *et al*., 2014), policy makers expected that industrial development would lead the process of transforming the economy from low productivity and low growth to high productivity and dynamic economy (Wangwe *et al*., 2014) which would in turn generate sustainable growth and reduce poverty. Noteworthy, 53 percent of the industrial structure in the economy is manufacturing. Processing and assembling industries constitute 43 percent and 4 percent respectively.

The manufacturing sector in Tanzania consists mainly of food processing, textiles and clothing and chemicals. Other manufacturing industries in the country include basic metal works, non-metallic mineral products, fabricated metal products, beverages, leather and leather products, paper and paper products, publishing and printing, and plastics. The sector has been transformed over time, reflecting changes in national policies, varying domestic demand and the world market dynamics. For example, the Government of Tanzania introduced Sustainable Industrial Development Policy (SIDP) in 1996 to phase itself out of investing directly in productive activities and let the private sector take that role so that the country becomes semi-industrialized by 2025. Indeed, following SIDP in 1996, manufacturing value addition rose tremendously and sustainably (Figure 2). However, the sector value added as a percent of GDP averages at 8 percent over the 1970-2015 period. Also, its growth rate has remained relatively low over the past 4 decades. Notwithstanding, the contribution of manufacturing to GDP must be at a minimum of 40 percent of the GDP in order for Tanzania to become a semi-industrialized country.

[2] Gold exports increased from less than 1 tonne in 1997 to 50 tonnes in 2013 (Ministry of Energy and Minerals, 2016).

Table 5. *Flows and Stocks of FDI by Activity (US$ Million), 2008-2012*

	Inflows							Stocks						
	2008	2009	2010	2011	2012	2012	%	2008	2009	2010	2011	2012	2012	%
Mining & quarrying	669.8	385	909.9	406.5	889.3	652.12	*45.6*	3714.1	4099.2	5009.1	5415.5	6304.8	4908.54	*51.9*
Manufacturing	277.6	215	157.1	217.3	563.7	286.04	*20*	870.7	1085.2	1242.3	1459.5	2023.3	1336.2	*14.1*
Accommodation	129.7	35.9	21.1	165.6	5.4	71.54	*5*	388.7	424.6	445.7	611.3	616.8	497.42	*5.3*
Finance & insurance	81.7	95.9	95.5	121.1	148.1	108.46	*7.6*	416.3	512.2	607.6	728.7	876.8	628.32	*6.6*
Information & Communication	127.6	185	83.5	-98.3	-420.1	-24.44	*-1.7*	532.4	717.4	801	702.7	282.6	607.22	*6.4*
Electricity & gas	1	2.1	290.5	209.4	618.3	224.26	*15.7*	24.7	26.8	317.3	526.7	1145	408.1	*4.3*
Wholesale & retail trade	21.1	-16.9	36.9	114.5	-35.2	24.08	*1.7*	372	355.1	392	506.5	471.3	419.38	*4.4*
Agriculture	21.2	29	22.9	31.4	11.2	23.14	*1.6*	202.3	231.3	254.2	285.6	296.8	254.04	*2.7*
Construction	-3.7	14.9	-23.5	30.7	-28.1	-1.94	*-0.1*	119.5	134.4	110.9	141.5	113.4	123.94	*1.3*
Real estate activities	26.5	1.5	1.5	12	23.4	12.98	*0.9*	79.7	81.2	82.8	94.7	118.1	91.3	*1*
Professional activities	-0.7	0.5	213	6.1	20.1	47.8	*3.3*	1.1	1.6	214.6	220.6	240.7	135.72	*1.4*
Transportation & storage	2.7	3.9	4	10.4	-1	4	*0.3*	28.8	32.7	36.7	47.1	46.1	38.28	*0.4*
Education	0.4	0.3	1.6	1.8	0.5	0.92	*0.1*	2	2.3	3.9	5.7	6.2	4.02	*0*
Other service activities	1.4	1.4	-0.8	1.1	3.9	1.4	*0.1*	3.8	5.2	4.4	5.5	9.4	5.66	*0.1*
ALL	*1356*	*953*	*1813.2*	*1229.6*	*1799.5*	*1430.36*	*100*	*6756.1*	*7709.2*	*9522.5*	*10752*	*12551*	*9458.14*	*100*

Source. *Tanzania Investment Report, (2013)* The sector faces a number of challenges including one, low levels of technology, irregular electricity and lack of skilled labour, two, a complex legal and institutional environment where laws are not enforced, three, limited access to financing and high cost of capital, inputs and energy, four, competition from imports, especially very cheap low- quality goods and five, official regulations, charges and taxes (Wangwe *et al*., 2014).

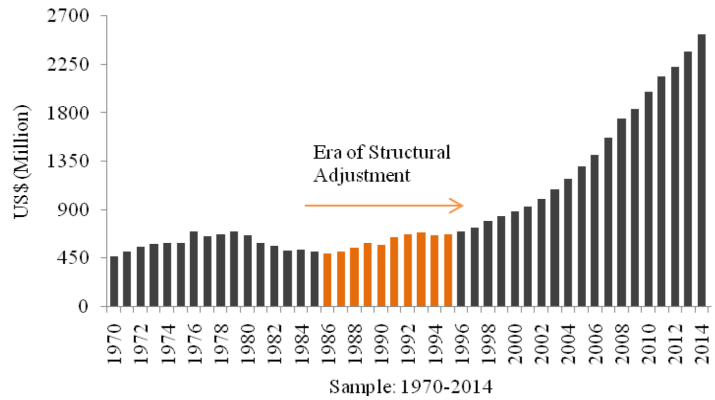

Figure 2. *Manufacturing Value Addition, 1970-2010*
Source: *Computed using data from UN Statistics Division (2015)*

FDI inflows are expected to provide the capital for the desired growth of manufacturing sector. Manufacturing FDI in Tanzania is mainly market- seeking, aimed at penetrating the local or regional markets. Green field investment, merger and acquisitions are the major entry modes of FDI inflows in manufacturing sector in Tanzania. Figure 3 presents the Greenfield manufacturing FDI inflows by sub-sector, over the 2003-2014 period. Also, Figure 4 reports the top sectors in manufacturing FDI for job creation Greenfield projects (as percent of total) over the same period. Non-metallic mineral products (including buildings and construction matrials) and food, beverage and tobacco had the largest shares of the Greenfield manufacturing FDI inflows. These shares are also reflected in the manufacturing FDI for job creation Greenfield projects.

Despite the improvement in manufacturing and mining sectors, agriculture is of critical importance to Tanzania. As stated earlier, the sector accounts for more than 70 percent of total employment but its total valued added is around 30 percent of GDP and its productivity is very low. Also, it makes up for about 17 percent of national export earnings (URT, 2012). Export earnings and employment aside, the need to develop agriculture sector is of paramount importance because of its contribution to food production, poverty reduction and industrial raw materials.

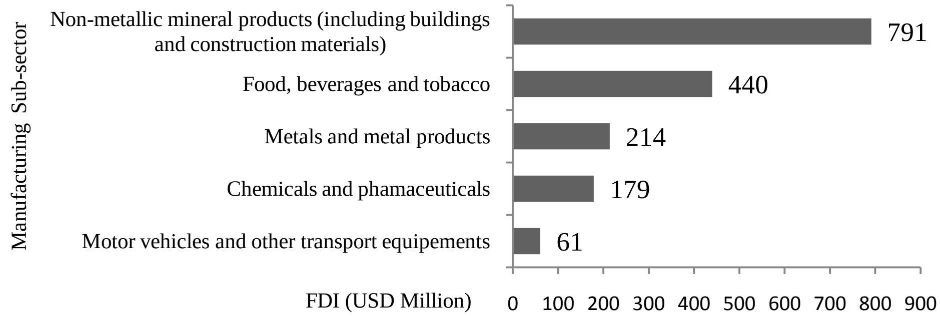

Figure 3. *Greenfield Manufacturing FDI Inflows by Sub-sector, 2003-2014, USD Million*

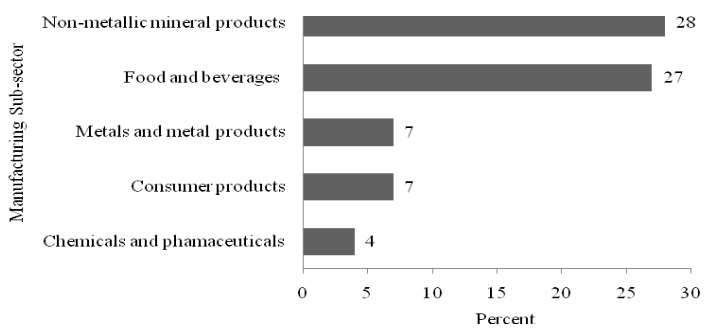

Figure 4. *Top sectors in Manufacturing FDI for Job Creation Greenfield Projects, 2003-2014 Percent of Total*

Turning to the agriculture sector, during the last two decades the growth of agriculture sector has been disappointing. The share of agriculture sector in GDP was 49 percent in 1970, 46 percent in 2002 and 26.5 percent in 2007 (Ministry of Agriculture, Food Security and Cooperatives, 2009). The fact that the overall GDP growth has been improving, decline in agriculture implies improvement in the growth in other sectors such as services, manufacturing and mining. It also suggests that the economy moves away from a subsistence economy. As a result, the growth of agriculture sector has been below real GDP growth rate over the last 2 decades (Figure 5). Indeed, the correlation between agriculture-to-GDP ratio and per capita GDP seems to be negative (Figure 6). Also, despite the fact that more than 80 percent of the poor population lives in rural areas and almost all of them rely on subsistence agriculture, valued added-to-GDP ratio has declined constantly during the last 2 decades while population has tremendously increased. This inverse relationship between agriculture value added and number of population, especially during the 1990-2015 period, is reported in Figure 7. In fact, around 10 million of this population is in poverty and 3.4 million is in extreme poverty, compared to respectively less than 1.9 million and 750,000 people who live in poverty and extreme poverty in the urban sector (World Bank Group, 2014).

Although agriculture sector has been given priority to reduced poverty, the sector faces many challenges. Many farm sizes are very small because of lack of finance and farming education. Also, factors such as lack of farming technology and climate change adversely affect the living standards of most of population which in turn increase unemployment, hunger and malnutrition. Low production apart, an increase in competition in the world market and shocks in commodity prices have reduced export of main cash crops (Figure 8), which in turn has led to further low production and increase in trade deficit. Thus, the overall positive economic growth experienced in the recent years is not driven by agricultural growth, and certainly not by small-scale farming.

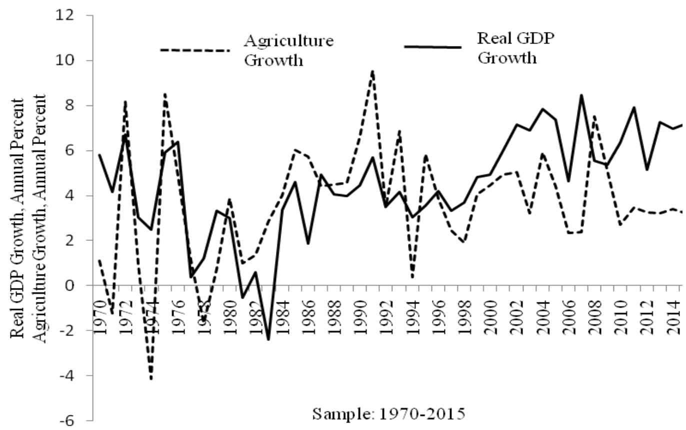

Figure 5. *Agriculture and Real GDP Growth, 1970-2015*

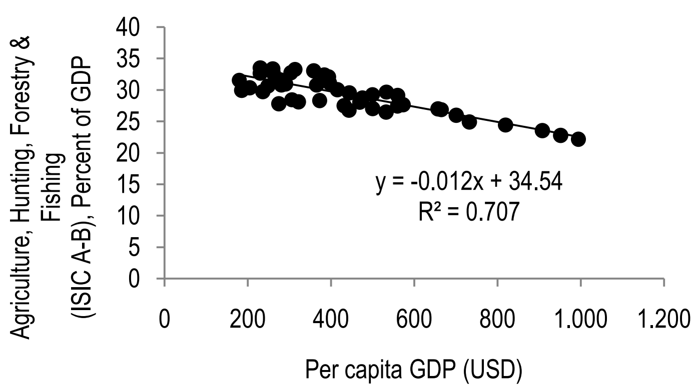

Figure 6. *Correlation between Per Capita GDP and Agriculture, Percent of GDP, 1970-2015*

Source: Computed Using World Bank, WDI Data (2016)

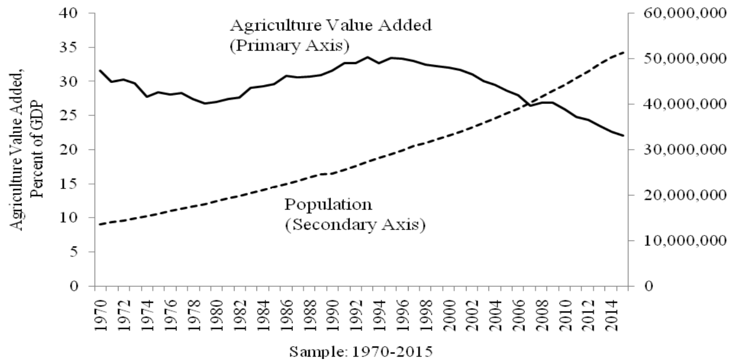

Figure 7. *Agriculture Value Added and Population, 1970-2015*
Source: Computed using data from UN Statistics Division (2015) and World Bank, WDI Data (2016)

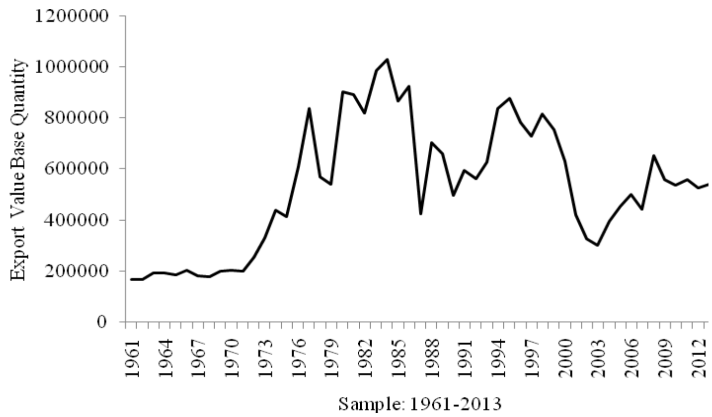

Figure 8. *Export Value Base Quantity: Total Agriculture Products*

With fertile soils and considerable water resources, the country provides conditions very well suited to the production of cash crops such as coffee, sisal, tobacco, tea, cotton, cashew nuts and pyrethrum and food crops such as maize, sorghum, millet, rice, wheat, beans, cassava and bananas for ensuring food security. Unfortunately, the sector has not been adequately supported in the past and has not yet performed to its full potential.

According to the Ministry of Agriculture, Food Security and Cooperatives (2009), approximately 3.5 million farm families cultivate about 4.5 million hectares of arable land. Crop yields are only 20 percent to 40 percent of their potential. Given the climate change and an increasing global warming, the country has a potential for attaining sustainable irrigation development in order to assure basic food security, improve national standards of living and also contribute to the economic growth of the country. The country has 29.4 million hectares of land suitable for irrigation. Out of these 2.3 million hectares have a high development potential, 4.8 million hectares medium and 22.3 million hectares low irrigation development potential (Ministry of Agriculture, Food Security and Cooperatives, 2009). Nevertheless, financial constraints and the lack of access to financial services limit the ability of small farmers to make the necessary investments and to cover recurrent costs that are associated with modern food supply chains (Reardon

& Gulati, 2008) despite the initiatives to provide subsidized inputs and credit and public extension services.

Overall, the low average productivity of most small-scale farmers in Tanzania and other Sub-Saharan African countries reveals that small-scale farmers are often unable to overcome the above-mentioned constraints to farming more efficiently, despite the systematic promotion of the smallholder model in the past decades (Collier & Dercon, 2009). Increasing FDI is one important factor contributing to the ongoing transformation of the agricultural sector. FDI in the agricultural sector could contribute to increasing global food supply within a relatively short time and thus contribute to reducing the risks of future food shortages and price hikes (Schüpbach, 2014).

FDI may reduce this yield gap by providing financial capital and introducing advanced agricultural technologies as well as the needed skills to employ them efficiently (UNCTAD 2009). Local producers may gain access to modern technologies and management techniques, either through direct cooperation with foreign companies (e.g. as contract farmers) or indirectly through spillovers effects (UNCTAD 2009, p. 160). Also, as Schüpbach (2014) reveals, increased competition may lead local firms to increase their efficiency in order to remain competitive.

Admittedly, planned expenditure is biased toward inputs and, recently, rural finance; few resources go to rural infrastructure, value addition, research, and extension. Irrigation expenditure has recently increased but remains insufficient to fill the gap in demand. Rural roads, which are critical for increased agriculture production and productivity, remain significantly underfunded. The total actual public spending on agriculture sector has grown at a slower pace. It increased by 30 percent from 2006/07 to 2010/11 reaching TZS 728 billion (FAO, 2013). In relative terms, however, the agricultural budget allocations have declined from almost 13 percent of total government spending in 2006/07 to about 9 percent in 2010/11 (FAO, 2013). Actual spending in relative terms has also decreased significantly in the same period. The highest share of agriculture sector expenditures in the total budget expenditures fell in the 2007/2008 financial year, both in terms of budget allocations and actual spending, reaching 15 and 17 percent respectively. The importance of agriculture in the total government expenditures has been constantly decreasing (FAO, 2013). Moreover, the analysis shows that large share agricultural sector expenditures goes into current spending, not into capital expenditure, which is critical for creating preconditions for long-term growth. Nevertheless, Tanzania's own capacity to fill financial gap is limited. Given the limitations of alternative sources of investment finance, foreign direct investment in developing country agriculture could make a significant contribution to bridging the investment gap.

In 2012 and 2013, the agriculture sector attracted few investors while manufacturing and tourism sectors attracted the largest number of local and foreign investors (Table 6). In 2013 for example, agriculture sector had only 12 approved foreign projects while manufacturing and tourism sectors, respectively, had 75 and 38 approved foreign projects. In 2012 and 2013, agriculture sector attracted 103 total projects worth TZS 1351 million with employment potentials of 72,574 people while manufacturing sector attracted 550 approved projects worth TZS 5319.80 million with employment potentials of only 50,966 people.

Table 6. *Approved Projects, 2012 and 2013*

	2012								2013							
	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H
Agriculture and Livestock	60	51	9	28	19	13	51,939	821.8	43	31	12	15	12	16	20,635	529.2
Natural Resources	2	0	2	2	0	0	110	5.6	6	5	1	2	3	1	2,526	73.3
Tourism	209	161	48	144	31	34	10,788	741.2	186	153	33	93	38	55	10,745	664.3
Manufacturing	225	184	41	86	74	65	24,039	2,976.40	258	225	33	95	75	88	26,927	2,343.40
Petroleum products &Mining	1	1	0	0	0	1	64	8.1	2	2	-	-	-	2	98	2.6
Commercial Buildings	128	113	15	78	30	20	57,541	838.9	132	120	12	77	20	35	9130	1,728.00
Transport	163	139	24	92	35	36	17,076	855	182	149	33	107	24	51	16,473	842.4
Services	15	15	0	1	7	7	1,892	424.3	8	5	3	1	3	4	570	29.9
Computer	2	0	2	1	0	1	67	7	1	1	-	-	1	-	50	1.9
Financial	7	4	3	3	2	2	755	67.1	4	4	-	1	-	3	6,979	9.9
Communication	4	2	2	2	0	2	803	2,969.70	9	8	1	1	2	5	2,244	944.7
Human Resources	33	29	4	20	4	9	1,781	95	32	27	5	14	5	13	2,813	177.2
Energy	7	7	0	2	2	3	4,529	1,344.10	8	6	2	4	-	5	2,593	823.1
Economic Infrastructure	7	6	1	5	1	1	2,901	261.5	7	6	1	2	-	5	100,369	80,035.10
Broadcasting	6	6	0	5	0	1	127	4.5	7	7	-	5	1	1	335	31.3
Total	*869*	*718*	*151*	*469*	*205*	*195*	*174,412*	*11,420.10*	*885*	*749*	*136*	*417*	*184*	*284*	*202,487*	*88,236.30*

A : Total number of approved projects; B: New projects C: Old projects (expansion and rehabilitation); D: Local projects; E: Foreign Projects; F: Joint projects; G: Total employment; H: Total investment (TZS Million)
Source: Tanzania Investment Centre (TIC) and National Bureau of Statistics (NBS), Statistical Abstract, 2013

Table 7. GDP, Employment and Relative Productivity Levels, Tanzania, 1991–2013

Economic activity	Gross Value Added (current US$, %)					Employment by Sector (%)					Relative Productivity Levels				
	1991	2000	2005	2010	2013	1991	2000	2005	2010	2013	1991	2000	2005	2010	2013
Agriculture	32.2	31.6	30	32	33.5	78.7	79.4	76	73	71.3	0.4	0.4	0.4	0.4	0.4
Mining & utilities	2.4	3.8	4.9	5.9	5.8	0.9	0.3	0.5	0.7	0.7	3.2	12.8	9.2	6.9	6.4
Manufacturing	8.9	8.1	7.5	7.3	7.2	2.1	1.5	2.5	3.2	3.3	3.6	4.8	3	2.6	2.5
Construction	4.1	5.3	8.3	7.6	9.7	0.8	0.8	1.1	1.3	1.4	6.5	8.1	7.2	6.5	7.5
Wholesale, retail, hotels	15.4	13.3	11.8	12.7	12.6	9.8	10.1	10.7	11.5	12.2	1.2	1.2	1.1	1.1	1
Transport, storage, communications	9.6	8.5	8.1	9	6.8	0.9	0.7	1.2	1.5	1.7	7.4	11.3	7	6.4	6.3
Other	27.4	29.4	29.4	25.5	24.5	6.8	7.2	7.9	8.7	9.4	4.6	4	3.7	3.2	3
Total	100	100	100	100	100	100	100	100	100	100	1	1	1	1	1

Notes: Derived by calculating labour productivity levels (gross value added at constant prices divided by number of persons employed per sector) and by expressing the result as a ratio of total economy labour productivity.

Despite the fact that FDI is seen as potentially providing developmental benefits through for example technology transfer and employment creation, the financial benefits to FDI to the economy of Tanzania is a matter of empirical research. In fact, how far FDIs go towards filling the investment gap is uncertain. The low levels of investment in agriculture have led to a decline in agriculture's share in total economy. Also, the importance of agriculture employment slowly declines reflecting a process of economic diversification from agriculture to new economic sectors and more urbanization. Nonetheless, agriculture remains the mainstay of the economy because of the sizeable share of the labour force engaged in the sector and its important role in the economy (Table 7). Although the mining and manufacturing sectors have registered important real growth rates in recent years, growth is forthcoming from a low base and both sectors still have relatively small shares of overall GDP.

FDI and investment distribution in other sectors is as reported in Tables 5 & 6. On average, electricity & gas, and services such as accommodation, finance & insurance, wholesale & retail trade and professional activities constitute a substantial proportion of FDI inflows and stocks. Service sector also constitutes the largest share in GDP. However, in view of rapid population growth, food security and the rising urbanization, significant improvements are required in productivity growth in agriculture in order to increase agricultural output through technological innovations and efficiency. Since over 70 percent of the population in Tanzania lives in rural areas and agriculture is the mainstay of their living, any strategies to address poverty must involve actions to improve agricultural productivity and farm incomes (Msuya, 2007). This also implies that the flow of FDI into agriculture in Tanzania is very important and central to increased productivity and poverty reduction. The correlations between FDI and per capita GDP and selected sectors of the economy are reported in Figures 9-12.

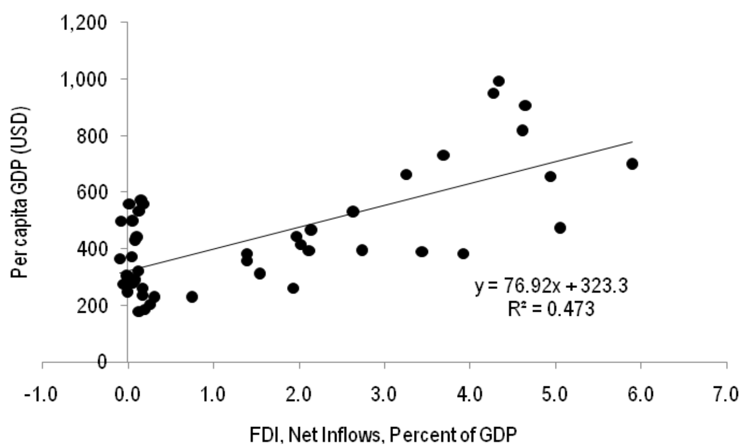

Figure 9. *Correlation between FDI and Real GDP, 1970-2015*

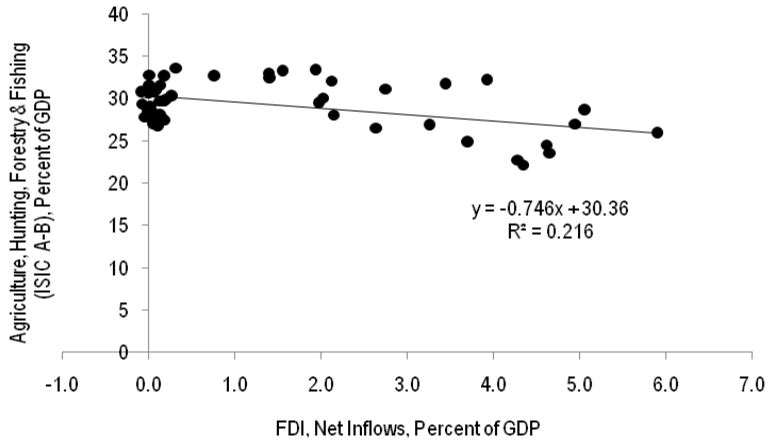

Figure 10. *Correlation between FDI and Agriculture, 1970-2015*

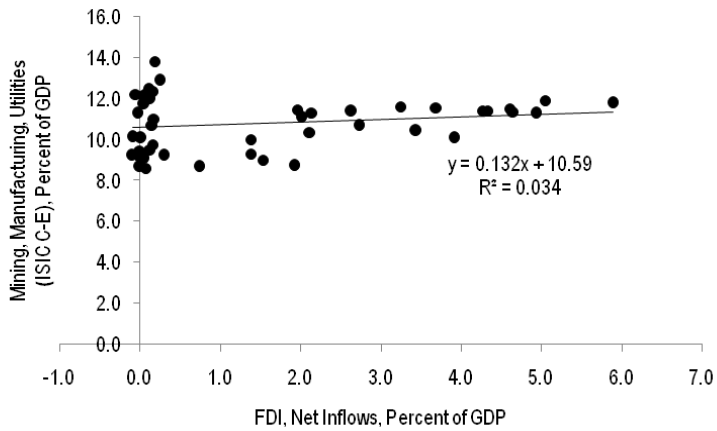

Figure 11. *Correlation between FDI and Mining, Manufacturing, & Utilities 1970-2015*

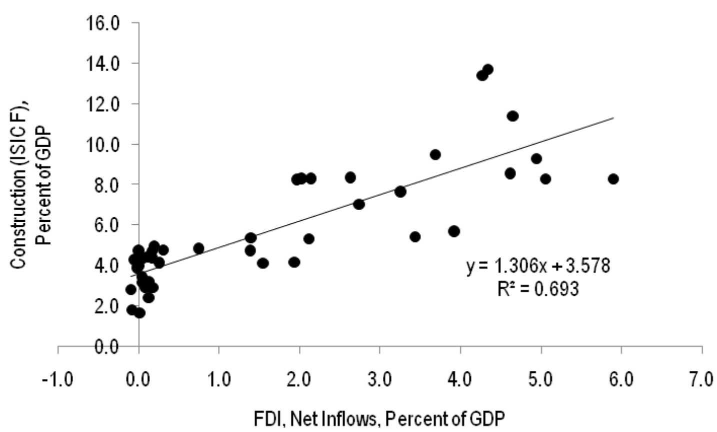

Figure 12. *Correlation between FDI and Construction, 1970-2015*

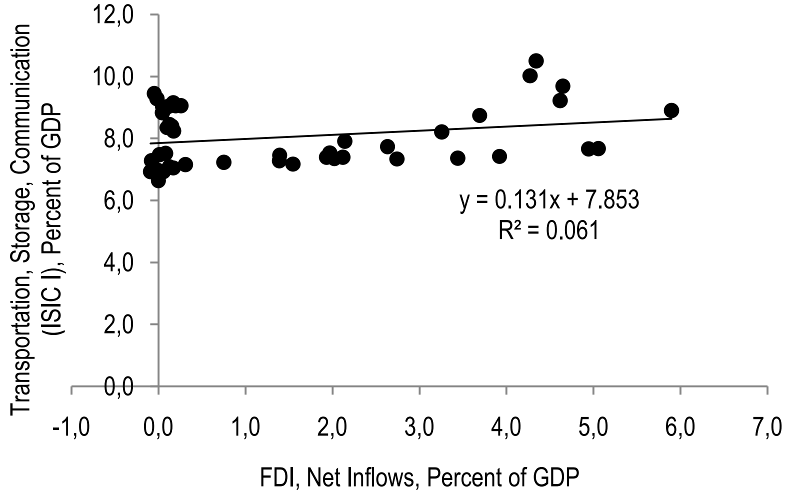

Figure 13: *Correlation between FDI and Transportation, Storage & Communication, 1970-2015*

3. Econometric Modeling and Data

3.1. Model Specification

A framework of analysis to examine the effects of FDI and control variables on selected sectors of the economy namely agriculture, mining, manufacturing, construction and transport, storage & communication is formulated by considering all those factors that can potentially play a meaningful role in the determination of value added-to-GDP ratios of all these sectors. Apart from FDI-to-GDP ratio, sectoral performance is basically determined by factors such as change in the real per capita income (*pGDP*), gross fixed capital formation (*GFCF*), trade liberalization or degree of openness (*TL*), real exchange rate (*RER*), labour force (*Labour*) and inflation rate (π). Also, availability of agricultural land (*Land*) may affect agricultural sector performance. Specified models for agriculture, mining, manufacturing, construction and transport, storage & communication sectors performance are as follows:

Model 1: Agricultural sector

$$\ln \Delta Agr_t = \alpha_0 + \alpha_1 \Delta \ln FDI_t + \alpha_2 \Delta \ln pGDP_t + \alpha_3 \Delta \ln Labour_t + \alpha_4 \Delta \ln GFCF_t \quad \alpha_5 \Delta \ln TL_t + \alpha_6 \Delta \ln RER_t + \alpha_7 \Delta \pi_t + \alpha_8 \Delta \ln Land_t + u_{1t} \tag{1}$$

Model 2: Mining sector

$$\ln \Delta Min_t = \beta_0 + \beta_1 \Delta \ln FDI_t + \beta_2 \Delta \ln pGDP_t + \beta_3 \Delta \ln Labour_t + \beta_4 \Delta \ln GFCF_t \quad \beta_5 \Delta \ln TL_t + \beta_6 \Delta \ln RER_t + \beta_7 \Delta \pi_t + u_{2t} \tag{2}$$

Model 3: Manufacturing sector

$$\ln \Delta Man_t = \gamma_0 + \gamma_1 \Delta \ln FDI_t + \gamma_2 \Delta \ln pGDP_t + \gamma_3 \Delta \ln Labour_t + \gamma_4 \Delta \ln GFCF_t \quad \gamma_5 \Delta \ln TL_t + \gamma_6 \Delta \ln RER_t + \gamma_7 \Delta \pi_t + u_{3t} \tag{3}$$

Model 4: Construction sector

$$\ln \Delta Const_t = \varphi_0 + \varphi_1 \Delta \ln FDI_t + \varphi_2 \Delta \ln pGDP_t + \varphi_3 \Delta \ln Labour_t + \varphi_4 \Delta \ln TL_t + \varphi_5 \Delta \ln RER_t + \varphi_6 \Delta \pi_t + u_{4t} \quad (4)$$

Model 5: Transportation, storage & communication sector

$$\ln \Delta TSC_t = \xi_0 + \xi_1 \Delta \ln FDI_t + \xi_2 \Delta \ln pGDP_t + \xi_3 \Delta \ln Labour_t + \xi_4 \Delta \ln GFCF_t \; \xi_5 \Delta \ln TL_t + \xi_6 \Delta \ln RER_t + \gamma_7 \Delta \pi_t + u_{5t} \quad (5)$$

where

$\alpha_{0,} \alpha_1, \alpha_2, \cdots, \alpha_8$; $\beta_0, \beta_1, \beta_2, \cdots, \beta_7$; $\gamma_0, \gamma_1, \gamma_2, \cdots, \gamma_7$; $\varphi_0, \varphi_1, \varphi_2, \cdots, \varphi_6$; $\xi_1, \xi_1, \xi_2, \cdots, \xi_7$	=	parameters to be estimated in the five models
$t = 1, \ldots. T$	=	the period of time, years
u	=	white noise error term, i.e. $u_t \sim N(0, \sigma^2)$
Δ	=	the first difference operator

The variables appearing in the equations are defined as follows

Agr	=	Agriculture, valued added, percent of GDP. Output in the agricultural sector is made up of crops production, animal farm production, forestry, fishing and hunting. Real aggregate valued added of these sub-sectors of agriculture to proxy for the agricultural sector
Min	=	Mining value added, percent of GDP
Man	=	Manufacturing value added, percent of GDP
Const	=	Construction value added, percent of GDP
TSC	=	Transportation, storage and communications value added, percent of GDP
FDI	=	Foreign direct investment, percent of GDP
pGDP	=	Per capita GDP (Real GDP growth/Population)
GFCF	=	Gross fixed capital formation, percent of GDP. GFCF is made up of machinery, plant, purchases of equipment, industrial buildings, construction of railways and roads.
π	=	Inflation rate, measured as the growth rate of consumer price index as a proxy of macroeconomic stability.
TL	=	Trade liberalization or trade openness, measured as export and import, percent of GDP.
RER	=	Real exchange rate. It is obtained by multiplying the nominal exchange rate by US CPI and divided by domestic CPI.
Labour	=	Population growth, annual percent
Land	=	Agricultural land (sq. km)

The log-linear functional forms are adopted to reduce the possibility or severity of heterogeneity and directly obtain sectoral elasticities with respect to regressors. The main hypothesis for the empirical work is that the contribution of FDI inflow to sectoral value added in Tanzania is positive. This can be confirmed or denied based on the estimated individual values of $\alpha_1, \beta_1, \gamma_1, \varphi_1 \, and \, \xi_1$ in the regression analyses. The null hypotheses are $H_0 : \alpha_1 = 0$, $H_0 : \beta_1 = 0$, $H_0 : \gamma_1 = 0$, $H_0 : \varphi_1 = 0$, and $H_0 : \xi_1 = 0$ i.e. FDI inflows do not contribute to individual sectoral valued added, while the alternative hypotheses are $H_1 : \alpha_1 \neq 0$, $H_1 : \beta_1 \neq 0$, $H_1 : \gamma_1 \neq 0$, $H_1 : \varphi_1 \neq 0$ and $H_1 : \xi_1 \neq 0$. The data for the variables which are included in the estimation models (agriculture, mining, manufacturing, construction and wholesale & retail trade sectors valued added, real per capita GDP, FDI, real exchange rate, trade as a percent of GDP, real exchange rate and inflation rate) are obtained from UN Statistics Division (2016) and World Bank World Development Indicators, UNCTAD, World Investment Report (2015), Bank of Tanzania and Tanzania Investment Centre.

The rationale for including the different variables in the models is based on theory and priory information. The main augment is that if FDI inflow increases then it will increase the value added of sectors such as agriculture, mining, manufacturing, construction and transport, storage and communication because FDI leads to advancement of the technology and improvement of managerial skills which ultimately lead to faster real growth rate of sectors of the economy. A number of previous studies have proven this argument. For example, Feldstein (2000) argues that FDI allows the transfer of technology especially in the form of new varieties of capital inputs, which cannot be achieved through financial investment or trade in goods and services. In the same line, Akulava (2010) argues that FDI provides firms and economies not only with financial resources, but also with modern technologies, advanced production facilities, new markets and new methods of administration. However, the impact of FDI on different sectors of the economy is not straight forward. For example, Findlay (1978) and Wang & Bloomstrom (1992) point out that the importance of FDI as a conduit for transferring technology, relates to the inflows of FDI to manufacturing, construction or service sectors rather than to the primary sector (i.e. agriculture and mining sectors). Indeed, Alfaro (2003) suggests that FDI in the primary sector tends to have a negative effect on growth, while investment in manufacturing and service sectors a positive one. In the service sector, the evidence is ambiguous (Alfaro, 2003). Transfers of technology and management know-how, introduction of new processes, and employee training tend to relate to the manufacturing sector rather than the agriculture or mining sectors (UNCTAD, 2001, Alfaro, 2003).

Also, there have been a number of studies in the area of FDI and construction and transport, storage & communication sectors. For example, Topku (2010) assesses the response of construction sector to FDI in India. Similarly, Andrew *et. al*. (2015) examine the co-integration regression analysis of FDI inflow into construction in Nigeria and find a positive and significant causal relationship at 5 percent level. Transportation, storage & communication sector is part of the tertiary sector which is basically services industry. Foreign investors can increase the efficiency of that sector by bringing new knowledge, technologies, making the overall level of services more corresponding to the world standards through the quality improvement and cost lowering (Akulava, 2011). Mathiyazhogan (2005) find a positive effect of FDI inflow on transportation. Also, Akulava (2011) shows a positive impact of FDI on the construction industry, but negative effect on construction materials and communications. However, as transportation, storage and communication sector is capital intensive, it is less competitive in comparison to manufacturing, hence, there is a possibility that the domestic firms may be crowded out by foreigners (Akulava, 2011). Besides, according to Tondl & Fornero (2008), a positive effect of FDI on transportation and telecommunication sector productivity depends on the income level of the country. By and large, single country studies for example Adhikary (2011) for Bangladesh, Nuzhart (2009) for Pakistan, Hong &Sun (2007) for China and Anuwar &Nguyen (2009) for Vietnam suggest that FDI has a positive and significant effect on sectoral productivity.

It is noteworthy that the complexity of the effect of FDI on different sectors of the economy means that there may be trade-offs between different benefits. For instance, Kabelwa (2006) argues that countries may have to choose between investments that offer short as opposed to long-term benefits; the former may lead to static gains but not necessarily to dynamic ones. The mixed effect of FDI on different sectors of the economy has been reported in many studies (Aitken & Harrison, 1999; Katrina *et al*., 2004; Blomsrtom *et al*., 1992, Caves, 1974). Thus, even though there is an obvious need in FDI for the economy, it is not clear enough, whether FDI has only a positive effect on all sectors of the Tanzanian economy and what sectors benefit and subsequently lead to economic growth. Since FDI attraction might be costly for the particular sector, it is significant to examine the causal relationship between FDI and different sectors of the economy.

Per capita income may affect economic sectors in different ways. Studies show that as per capita incomes rise, the share of agricultural expenditure in total expenditure declines and the share of expenditure on manufactured goods increase (Singariya & Sinha, 2015). This implies that per capita GDP is positively correlated with share of manufacturing sector while there is negative correlation between per capita GDP and value added share of agriculture sector in GDP. Singariya & Sinha (2015) find that the sign of the estimated coefficient in respect of the agriculture and manufacturing sectors are negative and positive respectively, which suggest that the share of agriculture sector and per capita GDP move in opposite direction while the positive coefficient for the share of manufacturing sector suggests that the share of manufacturing sector and per capita GDP move in same direction. According to Anderson (1987), the relative decline of agriculture is clear from both cross-sectional and time-series data. Moreover, in the literature, the nature of the relationship between the construction sector and per capita income is mixed. Also, according to Strassman (1970) construction sector, like agriculture or manufacturing, follows a pattern of change that reflects a country's level of development. After lagging in early development, construction accelerates in middle-income countries and then falls off. The reason for the inverted U-shaped curve lies in the fact that in the later stages of development there will be less population growth and migration into urban areas making less demand on housing (Anderson, 1987). At the same time there will already be in place a large stock of physical capital in the construction sector itself (Anderson, 1987). In a similar paper, Turin (1978) argues that, to the extent that economic growth is linked to the level and efficiency of capital formation, an association between construction investment and growth is not surprising given that construction output accounts for about 50 per cent of gross fixed capital formation in most countries. Nevertheless, Qifa (2013), using a confidence of 95 percent and smaller than the given significance level of $\alpha = 0.05$, suggests that a highly significant linear relationship exists between real GDP and construction value added in China and China. Also, the scatter diagrams reveal a significant linear relationship between real GDP and construction value added. However, the Bon curve suggests that the relationship between the share of construction in output and economic development is inverted U-shaped (Qifa, 2013). Furthermore, the level of development is related at improving both quantitative and qualitative infrastructure such transport, storage & communications.

Similarly, trade liberalization or openness of the economy is intended to promote productivity by exploiting comparative advantages that can be gained through exposure to foreign competition, enhanced technical development and access to economies of scale (Jayanthakumaran, 2002). Trade liberalization has become popular economic policy of both developed and developing countries. Liberalization may lead to efficient allocation of domestic resources which in turn reduces the production of import substitutes and increase production of exportable products which finally increases total output of agriculture, mining, manufacturing, and services sectors. In the same vein, the increase in exports and adjusting for efficient resource allocation may generate comparative advantages which eventually can result a higher producer surplus from the agricultural sector (De Silva, *et. al.*, 2013). According to Hassine, *et al.*, *(*2010), opening up foreign trade promotes productivity of agriculture. Trade liberalization may allow domestic firms access to cheaper and better technology and better quality inputs and managerial skills from abroad (Miller & Upadhyay, 2000, Baily & Gersbach 1995). The empirical study by De Silva *et al*., (2013) suggests that the trade openness is positively related to agricultural sector growth, whereas Yan *et al*., (2011) suggest that openness policy has a strong positive effect on total factor productivity growth, efficiency improvement and technological progress in construction sector. Trade liberalization may allow countries to import the R & D carried out by others because technical progress embodied in new materials, intermediate manufactured products, capital equipment are traded on international markets. In manufacturing sector, previous studies show that trade liberalization has a positive and significant impact on total factor productivity of the sector (Ousmanou & John, 2007; Mahadevan, 2002; Jonsson & Subramaniam, 2001, Anderson, 2001). Greater exposure to international competition generally has a beneficial effect in industry (Forountan, 1991).

Nonetheless, the nature of the relationship between trade policy and various sector of the economy remains very much an open question. Empirical studies provide conflicting results. Harris & Kherfi (2001) shows that trade openness has no significant effect on the rate of productivity growth in manufacturing while Adhikary (2011) finds that the degree of trade openness has a negatively affect on total factor productivity of manufacturing. Moreover, globalization may give negative effect on the construction sector through low quality of inputs, for example, low skills foreign workers which subsequently affect the output quality (Ismail *et al.*, 2012)

Also, inflation is one of the main variables in the growth of any sector. Cost-push and demand-pull inflation are two sources of inflation (Lipsey & Chrystal 2003). In a country when there is demand-pull inflation, due to increasing demand for food, producers are expected to invest more in the agricultural sector, resulting in an increased production which in turn lead to an increase in agriculture to GDP ratio (De Sormeaux & Pemberton, 2011). Indeed, Chaudhry *et al*., (2013) suggest that inflation and agriculture sector growth are positively and significantly related, and that very low level of inflation in the economy may not be beneficial to the growth of agriculture and services sectors. However, there is no consensus over the point after which the inflation is harmful to growth of the economy. Studies differ substantially across the countries (Epaphra, 2016, Chaudhry *et al.*, 2013). In an opposite view, when there is cost-push inflation, mainly because of a decrease in aggregate agricultural supply, which may be caused by either an increase in wages or an increase in the prices of raw materials, the costs of agricultural production will increase, which in turn lead to a decline in the ratio of agriculture to GDP (De Sormeaux & Pemberton, 2011).

By and large, the effect of inflation on sectoral output differs substantially according to the nature of the sector. For example, Chaudhry *et al*., (2013) find that inflation is harmful to the manufacturing sector growth; whereas, the effect of inflation on services sector growth is positive and statistically significant. However, inflationary increase in the price of construction materials has been one of the major banes to development and a contributing factor to frequent cost overruns and subsequently project abandonment (Oghenekevwe, *et al.*, 2014 and Kaming *et. al.*, 1997). The construction sector is vulnerable to inflation in prices of materials since construction projects involve extensive use of materials (Obiegbu, 2003). In fact, inflation can cause serious problems in the economic accruals or rate of return to constructors for works undertaken, thus loss of profit (Oyediran, 2006). In, the transportation, storage and communication sector, high inflation has a direct and adverse effect on the service providers and their customers' incomes, leading to a more difficult production and demand environment. This in turn reduces the ratio of transportation, storage & communication value added-to-GDP. For example, as the price of fuel increases and energy cost also moves up, variable cost structure increases. Increase in cost of production and decline demand following increase in price of services may reduce productivity.

Next in the list of control variables is real exchange rate. Exchange rate of a country plays a key role in international economic transactions. For example an increase in exchange rate may increase the demand of domestic products and the cost of imported capital and other imported inputs. If a firm is more dependent on imported inputs, there will be more variable costs and less marginal value of capital (Lotfalipour *et al.*, 2013). This suggests that a depreciation of exchange rate causes a reduction in the level of industrial investment. Contrary, there will be an increase in price competitiveness following an exchange rate appreciation (Lotfalipour *et al*., 2013). Indeed, those sectors, in which output price is determined in the world markets, are likely to be more sensitive to exchange rate movements. However, the effect of currency valuation changes on sectors that rely on export and imported inputs could be either positive or negative (Lotfalipour *et al*., 2013). A depreciation of the home currency gives domestic industries a cost advantage and their sales will rise (Krugman, 1979, Fung, 2008). According to Fung & Liu (2009), the direction and magnitude of changes in exports and domestic sales affect not only total sales but also productivity and investment. Nonetheless, empirical studies suggest mixed augments, for example, Kandilov & Leblebicioğlu (2011) find a negative effect of exchange rate fluctuations on the industrial sector whereas Fung & Liu (2009) show that the real depreciation lead to an increase in exports, domestic sales, total sales, value-added, and productivity. In addition, Harchaoui, *et al*., (2005) suggest that the exchange rate changes have no impact on industries investment. Exchange rate may also affect input prices. Likewise, commodity prices tend to be affected by a change in exchange rate (Longmire & Morey, 1983).

Also, theories and empirical studies show that factors such population growth rate or labour and gross fixed capital formation can affect the performance of a particular sector and the economy in general. For example, if a country experiences high population growth and therefore has a larger population base, then it can transfer labour to the expanding modern sectors, without reducing the agricultural labour supply (De Sormeaux & Pemberton, 2011). In this case, both the agricultural and modern sector may expand. In fact, population growth could therefore allow the rural sector to play a role in fostering economic growth (Pemberton, 2002). However, increasing population may also adversely affect agriculture-to-GDP ratio, because high population growth may result into pressures on agricultural production expansion leading into land degradation, which in turn lower land productivity (Pender, 1999). This also suggests that availability of agricultural land may lead to an increase in the ratio of agriculture valued added-to-GDP. Furthermore, studies show that a country that needs to meet her objective of economic development needs an increase in gross fixed capital formation. In fact, economic development may be measured through building of capital equipment on a sufficient scale to increase productivity in agriculture, mining, plantations and/or industry (Shuaib & Ndidi, 2015). However, capital is required to construct schools, hospitals, roads, railways, research and development and improve standards of living etc (Jhingan, 2006; Ainabor *et al*., 2014). Like the preceding factors, the effect of gross fixed capital formation on growth or productivity is not conclusive and indeed, it is a matter of empirical research. Some studies for example, Kormendi & Meguire (1985), Barro (1991), Levine & Renalt (1992) show that the rate of physical capital formation leads to growth, whiles other studies for example, Kendrick (1993) suggests that the capital formation alone does not lead to economic prosperity, rather the efficiency in allocating capital from less productive to more productive sectors influences growth.

In summary, it is noteworthy that the empirical literature on the linkage between FDI, level of development, trade liberalization or openness, population growth, gross fixed capital formation, real exchange rate and the rate of inflation and the sectoral performance does not provide a consensus. Some studies document positive effect of these variables on productivity and growth of sectors of the economy while others either report negative relationship or report weak relationship. Besides, the country specific characteristics with respect to the economical, technological, infrastructural and institutional developments indeed matter a lot to gauze empirical relationship (Adhikary, 2011). The present paper thus is of very significant and therefore, it extends a country specific analysis to add knowledge in the empirical literature.

3.2. Estimation Techniques

The ordinary least squares method (OLS) is used for estimation. OLS is simple and widely used in empirical work. If the model's error term is normally, independently and identically distributed (n.i.i.d.), OLS yields the most efficient unbiased estimators for the model's coefficients, i.e. no other technique can produce unbiased slope parameter estimators with lower standard errors (Ramírez *et al.*, 2002). The co-integration and error-correction methodology (ECM) is employed. The ECM helps minimizing the possibility of estimating spurious relations, while at the same time retaining long-run information in the data.

3.3. Nature of Data

3.3.1. Descriptive Statistics and Correlation

Time series data spanning from 1970 to 2015 are collected and analyzed empirically to determine the effect of FDI and other control variables on various sectors of the economy. In order to ensure trustworthiness of the data and estimation model, appropriate criteria for quantitative time series research such as normality distribution, matrix correlation and multicollinearity are employed and discussed. Tables 8 and 9 provide a descriptive statistics and correlations of the variables included in the model. Since, the calculation of *p*-values for hypothesis testing is based on the assumption that the population distribution is normal, test for normality assumption is vital. To this end, the Jarque-Bera (*JB*) statistic is applied to test for normal distribution of the series. This test is based on the sample skewness and sample kurtosis. In the *JB* test, the null and alternative hypotheses are set as follows:

H0: The variable is normally distributed.

H1: The variable is not normally distributed.

The test statistic is

$$JB = \frac{T}{6}\left(S^2 \frac{(K-3)^2}{4} \right) \quad (6)$$

with *S*, *K*, and *T* denoting the sample skewness, the sample kurtosis, and the sample size, respectively. Jarque-Bera statistics follows chi-square distribution with two degrees of freedom for large sample. The null hypothesis is rejected if the *p-value* $\leq$ level of significance, or if the $JB > \chi^2(2)$

As reported in Table 8, the descriptive statistics suggest that, the agriculture value added, mining value added, manufacturing value added, construction value added, transportation, storage & communication, gross fixed capital formation, trade liberalization, real exchange rate, the rate of inflation and agricultural land are approximately normally distributed because their respective skewness is close to 0 in absolute values. More significantly, the probabilities of these fail to reject the null hypothesis of normal distribution at 5 percent level of significance. However, both skewness and probabilities of FDI and real per capita GDP reject the null hypothesis of normal distribution. The failure of the normality test is addressed by transforming all variables, except the inflation rate, by using a natural logarithm operator (Stock & Watson, 2003; Murkhejee, White & Wuyts, 2003). The mean is used to measure the central tendency of the variables in the estimated models. The values of the standard deviation which measures the dispersion of the data from their means does not indicate more spread of the data from their means since the values are not larger in relation to the mean values. Likewise, the minimum and maximum values measure the degree of variations in

Table 8. *Summary of the Values of Variables*

	List of regressands					*List of regressors*							
	Agr	*Min*	*Man*	*Cons.*	*TSC*	*FDI*	*pGDP*	*Labour*	*GFCF*	*TL*	*RER*	*π*	*Land*
Mean	29.2	2.7	8.1	6.1	8.1	1.5	441.6	3.1	27.9	36.3	1097	16.6	333441.4
Median	29.6	2.5	7.8	5.8	7.7	0.3	392.2	3.1	29.5	37.5	1210.5	12.8	327500
Maximum	33.5	4.7	11.1	11.9	10.1	5.9	994	3.4	44.2	56.8	1838.1	36.1	397000
Minimum	22.7	1.3	6.4	2.2	6.6	0.1	179	2.5	11.1	17.2	331.8	3.5	290000
Std. Dev.	2.9	0.9	1.5	2.7	0.9	1.8	204.1	0.2	8.4	11.3	430.9	10.8	33022.7
Skewness	-0.5	0.2	0.8	0.6	0.5	0.8	1.1	-1.1	-0.2	-0.2	-0.3	0.4	0.5
Kurtosis	2.5	2.1	2.2	2.4	2.0	2.4	3.6	3.4	1.9	1.8	1.7	1.6	2.4
JB	2.3	1.9	6.1	3.1	3.9	6.5	9.4	9.1	2.5	2.9	3.6	5	2.9
Prob.	0.3	0.4	0.1	0.2	0.1	0	0	0	0.3	0.2	0.2	0.1	0.2
Obs.	46	46	46	46	46	46	46	46	46	46	46	46	46

Source. *Author's computations*

Table 9. *Correlation Matrix*

	List of regressands					List of regressors							
	Agr	*Min*	*Man*	*Cons.*	*TSC*	*FDI*	*pGDP*	*Labour*	*GFCF*	*TL*	*RER*	Π	*Land*
Agr	1												
Min	-0.18	1											
Man	-0.42	-0.48	1										
Cons	-0.49	0.71	-0.23	1									
TSC	-0.77	-0.15	0.77	0.27	1								
FDI	-0.46	0.76	0.28	0.87	0.24	1							
pGDP	-0.84	0.43	-0.05	0.64	0.36	0.69	1						
Labour	-0.44	-0.36	0.44	0.05	0.42	-0.16	0.19	1					
GFCF	-0.53	-0.07	0.73	0.36	0.72	0.17	0.18	0.53	1				
TL	-0.47	-0.02	0.42	0.55	0.29	0.31	0.24	0.65	0.82	1			
RER	0.18	0.54	-0.62	0.64	-0.27	0.5	0.04	-0.05	-0.01	0.27	1		
π	0.32	-0.54	-0.27	-0.56	-0.45	-0.56	-0.25	0.23	-0.51	-0.29	-0.19	1	
Land	-0.47	0.73	-0.49	0.89	-0.05	0.87	0.77	-0.04	0.04	0.27	0.61	-0.32	1

Source. *Authors computations*

the data. In addition to descriptive statistics, the JB statistics test is used to test for normality of the residuals and the results are reported in the empirical findings section.

In the same vein, Table 9 reports the correlation matrix of the variables of the regression model. Surprisingly, agriculture valued added, is negatively correlated with FDI, per capita GDP, labour, gross fixed capital formation and trade liberalization but positively correlated with inflation. In fact, these correlations are matters of empirical study interest. In contrast, and as it is expected, FDI is positively associated with per capita GDP, mining value added, manufacturing value added and construction value added. The correlation matrix also shows that the pair-wise correlations between regressors are not quite high (i.e. less than 0.8), indicating that multicollinearity is not a serious problem.

3.3.2. Unit Root Test

Many macroeconomic and financial time series such as exchange rates, real GDP and inflation exhibit stochastic trends or nonstationarity. In fact, they have a tendency not to revert to a mean level, but they wander for prolonged periods in one direction or the other. It is widely documented that trends, either stochastic or deterministic, may cause spurious regressions. This occurs when a non-stationary variable is regressed on a completely unrelated non-stationary variable but yields a reasonably high value of R^2, apparently indicating that the model fits well. This implies, it is very difficult to perform any hypothesis tests in models which inappropriately use non-stationary data since the test statistics will no longer follow the t or F distributions which are assumed they would, so any inferences which are made are likely to be invalid.

Such variables can be made stationary by transforming them into their differences. Stationarity or unit root tests are used to determine if trending data should be first differenced or regressed on deterministic functions of time to render the data stationary. A time series, Y_t is said to be stationary if its statistical properties (mean, variance, autocorrelation) do not vary with time. There are two different approaches to unit root or nonstationarity. Tests such as Kwiatkowski-Phillips-Schmidt-Shin (*KPSS*) test, Leybourne & McCabe test consider the null hypothesis that the series is stationary whereas tests such as Dickey-Fuller *(DF)* test, augmented Dickey-Fuller *(ADF)* test, Phillips-Perron *(PP)* test and DF-GLS test consider the null hypothesis that the series is not stationary. This paper uses *ADF* test. The ADF test makes a parametric correlation for higher-order correlation by assuming that the series follows autoregressive process and adjusting the test methodology. Moreover the ADF approach controls for higher-order correlation by adding lagged difference terms of the dependent variable to the right-hand side of the regression.

The basic idea behind the ADF unit root test for nonstationarity is to regress Y_t on its lagged value Y_{t-1} and find out if the estimated ρ is statistically equal to 1 or not in the model

$$Y_t - Y_{t-1} = (\psi - 1)Y_{t-1} + u_t \quad (7)$$

$$\Delta Y_t = \rho Y_{t-1} + u_t$$

where $\rho = (\psi - 1)$, and Δ is the first difference operator. Equation (7) is estimated and tested for the null hypothesis of $\rho = 0$ against the alternative of $\rho \neq 0$. If $\rho = 0$, then $\psi = 1$, there is a unit root problem and the series in equation is said to be nonstationary. In order to make the error term, u_t white noise, i.e. $u_t \sim NID(0, \sigma^2)$, the lags of the first difference are included in the regression equation. Therefore, the regression equation (7) is presented in the form

$$\Delta Y_t = \rho Y_{t-1} + \varphi_t \sum_{i=1}^{k} \Delta Y_{t-i} + u_t \quad (8)$$

Also, the intercept as well as a time trend t may be included to form

$$\Delta Y_t = \beta_1 + \beta_2 t + \rho Y_{t-1} + \varphi_t \sum_{i=1}^{m} \Delta Y_{t-i} + u_t \quad (9)$$

The testing procedure for the ADF unit root test is applied to the model

$$\Delta y_t = \phi + \beta t + \theta y_{t-1} + \sum_{j=1}^{q} \rho_j \Delta y_{t-j} + u_{it} \quad (10)$$

where ϕ is a constant, β is the coefficient on a time trend series, θ is the coefficient of y_{t-1}, q is the lag order of the autoregressive process, $\Delta y_t = y_t - y_{t-1}$ are first differences of y_t, y_{t-1} are lagged values of order one of y_t Δy_{t-j} are changes in lagged values, and u_{it} it is the white noise (Ssekuma, 2011).

The results of the ADF test are presented in Table 10. ADF Unit root test indicates that the hypothesis of a unit root cannot be rejected in all variables in levels. It is therefore concluded that all variables are non-stationary at their levels. However, the hypothesis of a unit root is rejected in first differences and hence the original series is integrated of order one i.e. $I(1)$. The unit root test results for the first difference are also reported in Table 10. This also suggests that in order to avoid spurious correlation, further estimations could be carried while in first difference.

3.3.3. Cointegration Test and Error Correction Model

Having established that the variables are non stationary at level but when integrated of the same order (i.e. first difference) they become stationary, the next procedure is to test the possibility of long run relationship among the variables used in the regression model. In fact, if there exists a stationary linear combination of nonstationary random variables, the variables combined are said to be cointegrated. Testing for cointegration is, thus, a test for the existence of the equilibrium relationship postulated. Engle & Granger (1987) two-step estimation procedure and the Johansen (1988) procedure are two procedures that are popularly used to identify and estimate the cointegrating vectors and the short run adjustment parameters. The former procedure involves normalizing the cointerating vector on one of the variables, which makes the assumption that the corresponding element of the cointegrating vector is non-zero. The Johansen procedure is a multivariate approach, the estimation of which would consume a lot of degree of freedom. In this paper, the Johansen procedure is used. The Johansen's procedure builds cointegrated variables directly on maximum

Table 10. *ADF Unit Root Test*

	Levels		First Difference, Δ	
Optimal Lag = 1	Constant $\alpha_1 = 0$	Constant and Trend $\alpha_1 = \alpha_2 = 0$	Constant $\alpha_1 = 0$	Constant & Trend $\alpha_1 = \alpha_2 = 0$
Ln(Agr)	-1.853	-1.230	-7.562	-8.068
Ln(Land)	0.597	-2.109	-6.722	-6.77
Ln(FDI)	-2.687	-3.409	-7.653	-7.567
Ln(pGDP)	-1.287	-1.749	-4.349	-4.301
Ln(Labour)	-1.357	-2.283	-5.770	-5.887
Ln(GFCF)	-2.254	-2.209	-4.585	-4.793
Ln(TL)	-0719	-2.528	-4.919	-4.994
Ln(RER)	-1.131	-1.713	-5.799	-5.729
π	-2.016	-2.508	-7.568	-7.695
Ln(Min)	-2.314	-2.286	-7.206	-7.149
Ln(Man)	-1.312	-0.489	-5.715	-6.118
Ln(Cons.)	-0.784	-2.275	-8.130	-8.239
Ln(TSC)	-0.566	-0.329	-7.655	-8.622
5% Critical Value	-2.928	-3.513	-2.929	-3.516

Null Hypothesis: *there is a unit root*
Source: *Author's computations*

Likelihood estimation instead of relying on OLS procedures (Johansen & Juselius, 1988).The main advantage of the Johansen Maximum Likelihood (ML) method is that it enables one to determine the number of existing cointegrating (i.e. long-run) relationships among the variables in hand. It is important to note that single equation-based approaches assume the uniqueness of the cointegrating vector.

The Johansen test is performed if all the variables are of the same order of non-stationary, and in fact are $I(1)$. The variables that are to be tested for cointegration are stacked into a *p*-dimensional vector y_t then a $p\times1$ vector of first differences, Δy_t, is constructed and form and estimate the vector autoregressive model

$$\Delta y_t = \Pi y_{t-k} + \Gamma_1 \Delta y_{t-1} + \Gamma_2 \Delta y_{t-2} + \ldots + \Gamma_{k-1} \Delta y_{t-(k-1)} + u_t \tag{11}$$

The rank of the matrix Π is tested. If Π is of zero rank (i.e. all the eigenvalues are not significantly different from zero), there is no cointegration, otherwise, the rank will give the number of cointegrating vectors (Brooks, 2008). The Johansen and Juselius maximum likelihood test is done on the variables in their non-stationary form and the trace test and maximum eigenvalue test, are as shown in equations (12) and (13) respectively.

$$J_{trace} = -T \sum_{i=r+1}^{n} \ln\left(1 - \hat{\lambda}_i\right) \tag{12}$$

$$J_{\max} = -T \ln\left(1 - \hat{\lambda}_{r+1}\right) \tag{13}$$

where J_{trace} is the trace statistic, $J_{\max}$ is the eigen-max statistc, T is the sample size and $\hat{\lambda}_i$ is the ith largest canonical correlation. The trace test tests the null hypothesis of r cointegrating vectors against the alternative hypothesis of n cointegrating vectors whereas the maximum eigenvalue test tests the null hypothesis of r cointegrating vectors against the alternative hypothesis of $r+1$ cointegrating vector (Hjalmarsson & Österholms, 2007).

The results for testing the number of cointegrating relations for the 5 models are reported in Tables 11.1-11.5. The first column is the number of cointegrating relations under the null hypothesis, the second column is the ordered eigenvalues of the Π matrix, the third column is the test statistic, and the last two columns are the 5 percent critical and probability values. The critical values are taken from MacKinnon-Haug-Michelis (1999). Trace statistic is used to determine the presence of co-integration between variables. On the basis of the trace statistic value test, the null hypothesis of no cointegration $(r=0)$ is rejected at the 5 percent level of significance in favour of the specific alternative, namely that there is at most 7 cointegrating vector, 6 cointegrating vector, 5 cointegrating vector, 5 cointegrating vector, and 4 cointegrating vector for model 1, model 2 model 3, model 4 and model 5 respectively[3]. The implication is that a linear combination of all the series for all models is found to be stationary and that there is a stable long-run relationship between the series.

If cointegration is proven to exist, then the next step is to estimate error correction model (*ECM*) that indicates the speed of adjustment from the short-run equilibrium to the long-run equilibrium state. Indeed, since there is co-integration among dependent variables and its fundamentals, an ECM has to be estimated by incorporating the lagged error correction term, ECM_{-1}, in the set of regressors (Johansein *et al*, 2010). The error correction term is the residual from the static long run regression and it joins the set of differenced non-stationary variables to be estimated to capture both short run and long run dynamics. The greater the coefficient of the parameter, the higher the speed of adjustment of the model from the short-run to the long run state will be.

Table 11. 1. *Johansen Tests for Cointegration*
Model 1: Series: *Agr, FDI , pGDP Labour, GFCF, TL, RER,* π and *Land*

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.944926	487.4641	197.3709	0.0001
At most 1 *	0.876037	362.8039	159.5297	0.0000
At most 2 *	0.848230	273.0298	125.6154	0.0000
At most 3 *	0.763553	191.9581	95.75366	0.0000
At most 4 *	0.686623	129.9508	69.81889	0.0000
At most 5 *	0.577073	80.05574	47.85613	0.0000
At most 6 *	0.504724	43.05188	29.79707	0.0009
At most 7	0.234636	12.83832	15.49471	0.1209
At most 8	0.030682	1.339978	3.841466	0.2470

Trace test indicates 7 cointegrating eqn(s) at the 0.05 level
** denotes rejection of the hypothesis at the 0.05 level*
***MacKinnon-Haug-Michelis (1999) p-values*

[3] This is because the first significant value, where trace statistic is less than critical value at 5 percent level, is found at maximum rank of 7, 6, 5, 5, and 4.

Table 11.2. *Johansen Tests for Cointegration*

Model 2: Series: *Min, FDI, pGDP, Labour, GFCF, TL, RER, and* π

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.754196	229.9379	159.5297	0.0000
At most 1 *	0.632015	168.1962	125.6154	0.0000
At most 2 *	0.565840	124.2089	95.75366	0.0002
At most 3 *	0.511048	87.49787	69.81889	0.0010
At most 4 *	0.425635	56.01631	47.85613	0.0071
At most 5 *	0.342521	31.61877	29.79707	0.0305
At most 6	0.258041	13.16770	15.49471	0.1088
At most 7	0.000804	0.035387	3.841466	0.8507

Trace test indicates 6 cointegrating eqn(s) at the 0.05 level
** denotes rejection of the hypothesis at the 0.05 level*
***MacKinnon-Haug-Michelis (1999) p-values*

Table 11.3. *Johansen Tests for Cointegration*

Model 3: Series: *Man, FDI , pGDP, Labour, GFCF, TL, RER and* π

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.775949	242.9874	159.5297	0.0000
At most 1 *	0.685538	177.1686	125.6154	0.0000
At most 2 *	0.610239	126.2653	95.75366	0.0001
At most 3 *	0.510811	84.80754	69.81889	0.0020
At most 4 *	0.457706	53.34729	47.85613	0.0140
At most 5	0.309122	26.42167	29.79707	0.1166
At most 6	0.200013	10.15079	15.49471	0.2693
At most 7	0.007512	0.331764	3.841466	0.5646

Trace test indicates 5 cointegrating eqn(s) at the 0.05 level
** denotes rejection of the hypothesis at the 0.05 level*
***MacKinnon-Haug-Michelis (1999) p-values*

Table 11.4. *Johansen Tests for Cointegration*

Model 4: Series: *Cons, FDI, pGDP, Labour, GFCF, TL, RER and* π

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.875519	248.1794	159.5297	0.0000
At most 1 *	0.617839	156.5009	125.6154	0.0002
At most 2 *	0.531377	114.1767	95.75366	0.0015
At most 3 *	0.458583	80.82659	69.81889	0.0051
At most 4 *	0.435296	53.82969	47.85613	0.0124
At most 5	0.301857	28.68573	29.79707	0.0667
At most 6	0.251977	12.87514	15.49471	0.1195
At most 7	0.002293	0.100996	3.841466	0.7506

Trace test indicates 5 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (*1999*) p-values

Table 11.5. *Johansen Tests for Cointegration*
Model 5: Series: *TSC, FDI, pGD, Labour, GFCF, TL, RER and* π

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.815332	234.1974	159.5297	0.0000
At most 1 *	0.680481	159.8727	125.6154	0.0001
At most 2 *	0.526750	109.6714	95.75366	0.0039
At most 3 *	0.469332	76.75366	69.81889	0.0126
At most 4 *	0.371358	48.87440	47.85613	0.0400
At most 5	0.335801	28.44988	29.79707	0.0709
At most 6	0.190902	10.44624	15.49471	0.2480
At most 7	0.025255	1.125499	3.841466	0.2887

Trace test indicates 5 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (*1999*) p-values

4. Empirical Results and Discussions

The results of the regression analysis for the five models are reported in Tables 12.1-16.2. The last four models are estimated without *land.* The Durbin Watson (DW) statistic included in the result is used to test for auto-correlation in the error term. It should be noted that, as a rule of thumb, if DW is found to be 2 in an application one may conclude that there is no first order autocorrelation either positive or negative. Therefore, the closer DW is to 2, the greater the evidence of no serial correlation in the residuals. Also, various diagnostic tests are used to assess the model. These include White Heteroskedasticity test, Breusch-Godfred LM test, ARCH LM test, Ramsey RESET and JB Normality test. The heteroskedasticity test is based on the null hypothesis of heteroskedasticity not present, LM test for autocorrelation up to order 1 is based on the null hypothesis that there is no autocorrelation; test for ARCH of order 1 is based on the null hypothesis that no ARCH effect is present, the Ramsey RESET test for specification is based on the null hypothesis of adequate specification, and test for normality of residuals is based on null hypothesis that the errors are normally distributed. In view of these hypotheses, the regression models pass all specification tests. On the same importance, the F-statistic is significant at 1 percent level in all models, except model 5, rejecting the null hypotheses that the coefficients are equal to zero. Model 5, itself has a significant F-statistic of 5 percent. This implies that the models are significantly explained by the regressors hence acceptable in overall terms. In addition, cumulative sum of recursive residuals (CUSUM) is used to test the stability of the models. In the use of the CUSUM plots, if the statistics stay within the critical bonds of 5 percent level of significance, the null hypothesis of all coefficients in the given regression are stable and cannot be rejected. Understandably the R^2 and adjusted R^2 are relative low, however, low values of R^2, do not mean that factors in disturbance term are correlated with the independent variables (Wooldridge, 2006). The t values and standard errors are presented to test for the significance of the coefficient estimates. The *p*-values indicate the level of significance.

The results show that, inconsistent with the a priori expectation, the coefficient of FDI in the agricultural sector has a negative sign and statistically significant at 5 percent level. On average, a 1 percent increase in FDI-to-GDP ratio may lead to an average of 0.005 percent decrease in agriculture valued added-to-GDP ratio, holding other factors constant. Indeed, this is a surprising result; however, the inverse causal relationship between FDI and agriculture value added can be attributed to many factors including low flow of FDI in the agricultural sector relative to mining and manufacturing sectors. This is evidenced by relative few approved projects in agriculture sector. Also, poor quality products and the lack of adequate infrastructure results in high energy and transportation costs rendering commodities non-competitive which in turn results into loss of market share. Furthermore, agricultural sector depends on smallholder producers with limited education and experience and are exposed to shock. As a result, the ratio of agriculture value added-to-GDP has been declining despite the fact that FDI-to-GDP ratio has been slightly increasing. This also suggests that FDI is still needed in agriculture sector. Some impacts of FDI in the agriculture sector should be measured in knowledge acquisition, technology and international image.

As it is expected, the coefficients for the FDI-to-GDP ratio on manufacturing, construction and transport, storage and communication sectors are positive and respectively, statistically significant at 5 percent, 1 percent and 1 percent levels. A 1 percent increase in FDI-to-GDP ratio may lead, on average, to a 0.006 percent increase in manufacturing value added-to-GDP ratio, other factors being equal. In fact, the positive impact of FDI on manufacturing sector is not surprising because the proportion of FDI inflows to this sector is substantial. Also, results suggest that a 1 percent increase in FDI-to-GDP ratio may lead, on average, to a 0.01 percent increase in transport, storage and communication value added-to-GDP ratio. Moreover, FDI seems to have a positive and very strong effect on construction sector in Tanzania. On average, a 1 percent increase in the ratio of FDI-to-GDP may lead to a 0.65 increase in the ratio of construction value added-to-GDP ceteris paribus. This is very important for the economy because construction sector occupies a significant focal point to the process of development. The fact, that FDI is associated with technology advancement, transfer of advanced skills and management, market access and competition improvement, it is anticipated FDI to lead to an increase in value added of manufacturing, construction, and transport, storage and communication sectors.

The coefficient of FDI on the mining sector seems to be statistically insignificant. This suggests that FDI exerts no effect on mining value added. The lack of causal relationship between FDI and mining sector, despite the fact that the sector is predominantly dominated by foreign investor is very interesting. However, this result is very similar to that of Rutaihwa & Simwela (2012). In fact, cross-country studies reveal negative relationship of FDI in the growth of primary sector (agriculture and mining) and positive in the secondary sector (manufacturing and construction industry). For example, Khaliq & Noy (2000) reveal a negative effect of FDI on the growth in the mining & quarrying. This mixed results, confirms the findings by Alfaro (2003); Noy & Vu (2007); Aykut & Sayek (2007); Mathiyazhogan (2005); Khaliq & Noy (2006). In particular, Chandana (2008) suggests that growth effects of FDI vary widely across sectors. FDI stocks and output are mutually reinforcing in the manufacturing sector, whereas any causal relationship is absent in the primary sector (Chandana, 2008)

Table 12.1. *Empirical Results, Dependent Variable: ΔLn(Agr)*

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.509	0.521	0.976	0.336
Δ *Ln(Agr)*$_{-1}$	-0.223	0.255	-0.875	0.388
Δ*Ln(FDI)*	-0.005**	0.002	-2.430	0.020
Δ*Ln(pGDP)*	-0.094*	0.048	-1.941	0.061
Δ*Ln(Labour)*	4.066**	1.796	2.264	0.030
Δ*Ln(GFCF)*	-0.061*	0.032	-1.911	0.065
Δ*Ln(TL)*	-0.035*	0.020	-1.774	0.085
Δ*Ln(RER)*	0.011	0.030	0.358	0.722
$\Delta\pi$	-0.001	0.001	-1.013	0.318
Δ*Ln(Land)*	-0.038	0.041	-0.926	0.360
ECM$_{-1}$	-0.020*	0.011	-1.836	0.075
R-squared	0.502	Durbin-Watson stat		1.970
Adjusted R-squared	0.346			
F-statistic	3.22			
Prob(F-statistic)	0.005			

***, **, * *show significant at 1, 5 and 10 percent level of significance*

Table 12.2. *Serial Correlation, Heteroskedasticity and Ramsey RESET Tests*

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.052263	Prob. F(2,30)	0.9492
Obs*R-squared	0.149299	Prob. Chi-Square(2)	0.9281
Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	1.424708	Prob. F(10,32)	0.2143
Obs*R-squared	13.24677	Prob. Chi-Square(10)	0.2102
Heteroskedasticity Test: ARCH			
F-statistic	0.028029	Prob. F(2,38)	0.9724
Obs*R-squared	0.060395	Prob. Chi-Square(2)	0.9703

Ramsey RESET Test

	Value	Probability
t-statistic	0.543413	0.5907
F-statistic	0.295297	0.5907
Likelihood ratio	0.407667	0.5232

Source: *Author's Computation*

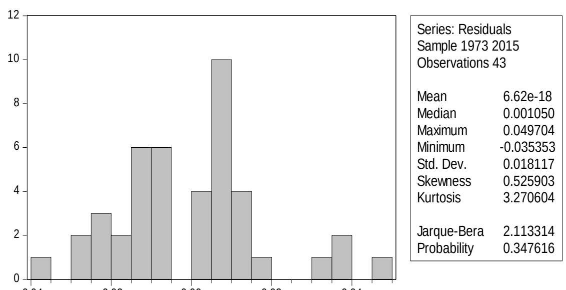

Figure 12.1. Model1, *Normality Test of the Residuals: Histogram*
Source: *Author's Computation*

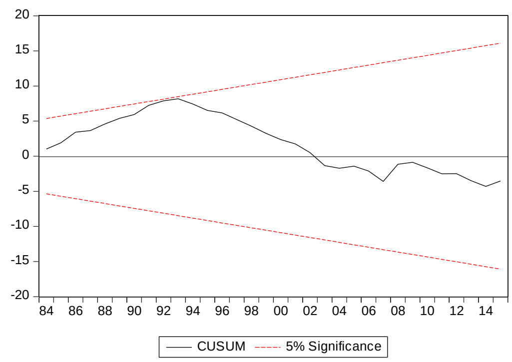

Figure 12.2. *Model 1, Stability Test: CUSUM*
Source: *Author's Computation*

Table 13.1. *Empirical Results, Dependent Variable: ΔLn(Min)*

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.006	0.282	0.023	0.982
Δ $Ln(Min)_{-1}$	1.193**	0.290	4.106	0.000
Δ*Ln(FDI)*	0.004	0.011	0.328	0.744
Δ*Ln(pGDP)*	0.425*	0.219	1.946	0.060
Δ*Ln(GFCF)*	0.362**	0.174	2.077	0.046
Δ*Ln(Labour)*	0.994	9.191	0.108	0.914
Δ*Ln(TL)*	-0.305***	0.111	-2.732	0.010
Δ*Ln(RER)*	-0.358**	0.158	-2.266	0.030
Δ π	0.001	0.002	0.455	0.652
ECM_{-1}	-1.328***	0.318	-4.172	0.000
R-squared	0.490	Durbin-Watson stat		1.946
Adjusted R-squared	0.350			
F-statistic	3.517			
Prob(F-statistic)	0.003			

***, **, * *show significant at 1, 5 and 10 percent level of significance*
Source: *Author's Computation*

Table 13.2. *Serial Correlation, Heteroskedasticity and Ramsey RESET Tests*

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.912784	Prob. F(2,31)	0.4119
Obs*R-squared	2.391411	Prob. Chi-Square(2)	0.3025
Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.778900	Prob. F(9,33)	0.6368
Obs*R-squared	7.533952	Prob. Chi-Square(9)	0.5817
Heteroskedasticity Test: ARCH			
F-statistic	1.175212	Prob. F(2,38)	0.3197
Obs*R-squared	2.388263	Prob. Chi-Square(2)	0.3030
Ramsey RESET Test			
	Value	*Probability*	
t-statistic	0.491753	0.6263	
F-statistic	0.241821	0.6263	
Likelihood ratio	0.323726	0.5694	

Source: *Author's Computations*

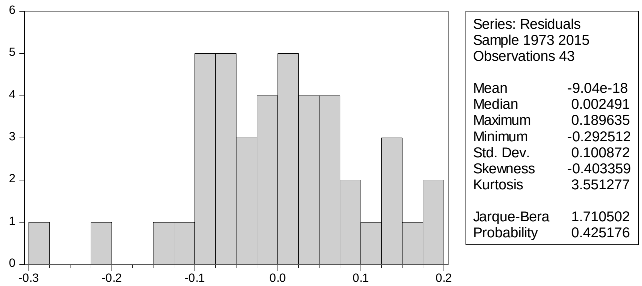

Figure 13.1. *Model 2, Normality Test of the Residuals: Histogram*
Source: *Author's Computation*

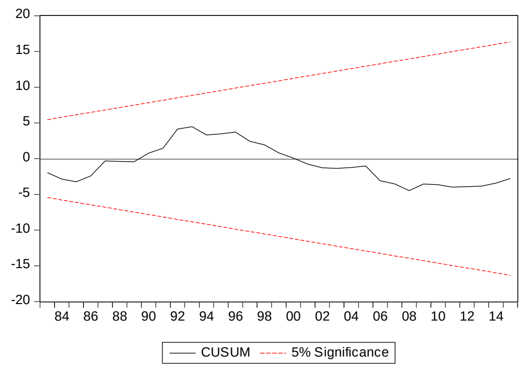

Figure 13.2. *Model 2, Stability Test: CUSUM*
Source: *Author's Computation*

Table 14.1. Empirical Results, *Dependent Variable: ΔLn(Man)*

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.012**	0.006	-1.986	0.054
Δ *Ln(Man)*$_{-1}$	0.327	0.209	1.618	0.115
Δ*Ln(*FDI)	0.006**	0.003	1.981	0.054
Δ*Ln(*pGDP)	0.176***	0.064	2.754	0.009
Δ*Ln(GFCF)*	0.115**	0.053	2.140	0.039
Δ*Ln(Labour)*	0.177	0.189	0.935	0.356
Δ*Ln(TL)*	-0.024	0.042	-0.576	0.568
Δ*Ln*(RER)	0.049	0.048	1.022	0.314
Δ π	-0.003***	0.001	-3.472	0.002
ECM$_{-1}$	-0.559**	0.255	-2.178	0.037
R-squared	0.565	Durbin-Watson stat		2.108017
Adjusted R-squared	0.446			
F-statistic	4.756			
Prob(F-statistic)	0.000			

***, **, * *show significant at 1, 5 and 10 percent level of significance*
Source: *Author's Computation*

Table 14.2. *Serial Correlation, Heteroskedasticity and Ramsey RESET Tests*

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.997390	Prob. F(2,31)	0.3804
Obs*R-squared	2.599671	Prob. Chi-Square(2)	0.2726
Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.483911	Prob. F(9,33)	0.8748
Obs*R-squared	5.013321	Prob. Chi-Square(9)	0.8331
Heteroskedasticity Test: ARCH			
F-statistic	0.016281	Prob. F(2,38)	0.9839
Obs*R-squared	0.035103	Prob. Chi-Square(2)	0.9826
Ramsey RESET Test			
	Value	*Probability*	
t-statistic	1.625417	0.1139	
F-statistic	2.641980	0.1139	
Likelihood ratio	3.411204	0.0648	

Source: *Author's Computation*

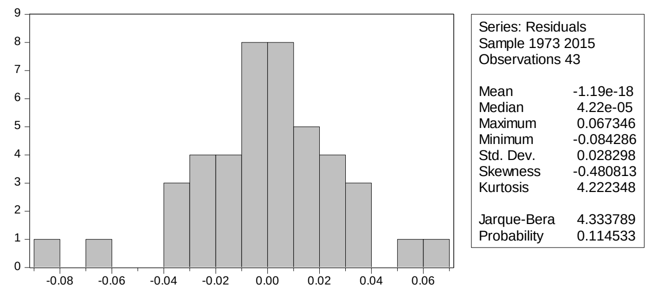

Figure 14.1. *Model 3, Normality Test of the Residuals: Histogram*
Source: *Author's Computation*

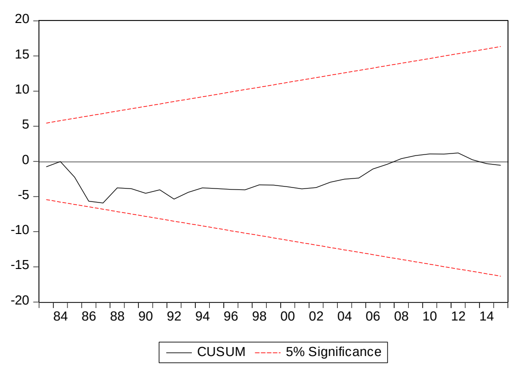

Figure 14.2: *Model 3, Stability Test: CUSUM*
Source: *Author's Computation*

Table 15.1. *Empirical Results, Dependent Variable, ΔLn(Cons)*

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.037*	0.019	1.905	0.065
Δ *Ln(Cons)*$_{-1}$	-0.013	0.195	-0.066	0.947
Δ*Ln(FDI)*	0.653***	0.175	3.733	0.000
Δ*Ln(pGDP)*	0.421**	0.208	2.022	0.051
Δ*Ln(Labour)*	0.035	0.627	0.056	0.955
Δ*Ln(RER)*	-0.258*	0.152	-1.700	0.089
Δ*Ln(TL)*	0.084	0.133	0.633	0.531
$\Delta \pi$	0.006**	0.003	2.222	0.033
ECM$_{-1}$	-0.024**	0.011	-2.161	0.038
R-squared	0.609	Durbin-Watson stat		2.051
Adjusted R-squared	0.503			
F-statistic	5.722			
Prob(F-statistic)	0.000			

***, **, * *show significant at 1, 5 and 10 percent level of significance*
Source: *Author's Computation*

Table 15.2. *Serial Correlation, Heteroskedasticity and Ramsey RESET Tests*

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	1.069894	Prob. F(2,31)	0.3554
Obs*R-squared	2.776448	Prob. Chi-Square(2)	0.2495
Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	1.584104	Prob. F(9,33)	0.1609
Obs*R-squared	12.97266	Prob. Chi-Square(9)	0.1638
Heteroskedasticity Test: ARCH			
F-statistic	0.892834	Prob. F(2,38)	0.4179
Obs*R-squared	1.840171	Prob. Chi-Square(2)	0.3985
Ramsey RESET Test			
	Value	Probability	
t-statistic	0.122103	0.9036	
F-statistic	0.014909	0.9036	
Likelihood ratio	0.020030	0.8875	

Source: *Author's Computation*

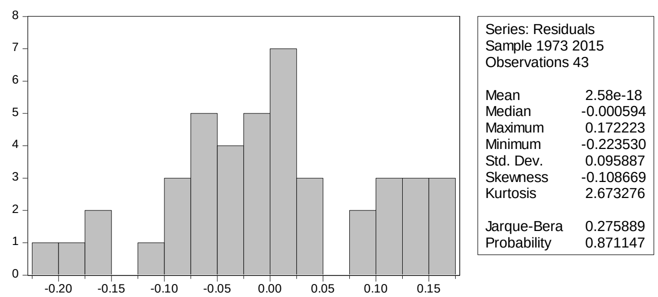

Figure 15.1. Model 4, *Normality Test of the Residuals: Histogram*
Source*: Author's computations*

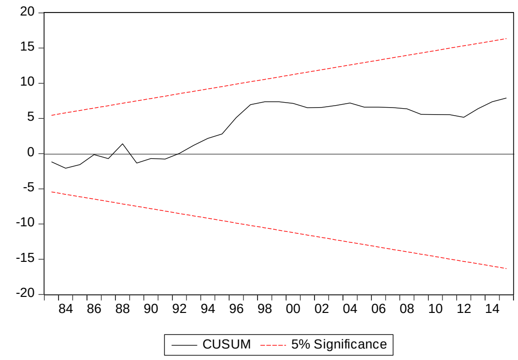

Figure 15.2. *Model 4, Stability Test: CUSUM*
Source: *Author's Computation*

Table 16.1. *Empirical Results, Dependent Variable ΔLn(TSC)*

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.012	0.007	1.673	0.103
Δ *Ln(TSC)*$_{-1}$	-0.646**	0.289	-2.236	0.032
Δ*Ln (FDI)*	0.011***	0.003	3.711	0.001
Δ*Ln (pGDP)*	0.011	0.072	0.159	0.875
Δ*Ln (GFCF)*	0.054	0.054	1.010	0.310
Δ*Ln (Labour)*	-0.008	0.223	-0.038	0.970
Δ*Ln (TL)*	0.089*	0.049	1.827	0.076
Δ*Ln(RER)*	-0.065	0.057	-1.134	0.265
$\Delta \pi$	-0.001	0.001	-0.358	0.722
ECM$_{-1}$	-0.064	0.024	-2.624	0.0128
R-squared	0.387461	Durbin-Watson stat		2.006436
Adjusted R-squared	0.220405			
F-statistic	2.319350			
Prob(F-statistic)	0.037848			

***, **, * *show significant at 1, 5 and 10 percent level of significance*
Source: *Author's Computation*

Table 16.2. *Serial Correlation, Heteroskedasticity and Ramsey RESET Tests Breusch-Godfrey Serial Correlation LM Test:*

F-statistic	0.125124	Prob. F(2,31)	0.8828
Obs*R-squared	0.344339	Prob. Chi-Square(2)	0.8418
Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.930346	Prob. F(9,33)	0.5123
Obs*R-squared	8.702363	Prob. Chi-Square(9)	0.4652
Scaled explained SS	5.047840	Prob. Chi-Square(9)	0.8301
Heteroskedasticity Test: ARCH			
F-statistic	1.616457	Prob. F(8,26)	0.1684
Obs*R-squared	11.62571	Prob. Chi-Square(8)	0.1687
Ramsey RESET Test			

	Value	Probability
F-statistic	1.505043	0.2142
Likelihood ratio	12.40645	0.0535

Source: *Author's Computation*

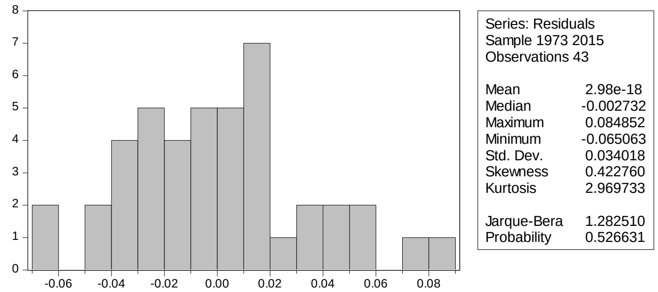

Figure 16.1. *Model 5, Normality Test of the Residuals: Histogram*
Source: Author's Computations

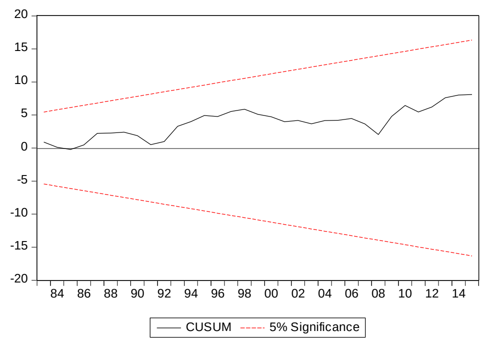

Figure 16.2. Stability Test: CUSUM
Source: *Author's Computation*

The level of development as proxied by real per capita GDP suggests mixed results across sectors. As it is expected, the real per capita GDP shows a positive impact on the value added in the manufacturing, mining and construction sectors at 1 percent, 5 percent and 5 percent levels, respectively. In contrast, the coefficient of real per capita GDP in agriculture is negative and statistically significant at 10 percent level. Results suggest that if the growth of real per capita GDP growth increases by 1 percent, the agriculture value added-to-GDP ratio may, on average, decrease by 0.09 percent. This negative effect of the level of development on agricultural sector may not be very surprising but it is interesting. The importance of agriculture to the economy of Tanzania has declined especially over the last 25 years despite the fact that it forms the basis for food security and that over 70 percent of the population lives in rural areas where agriculture and related non-farm activities are their main occupation. In addition, agriculture produces materials for agro-processing industries which are the main types of industries under the current level of development in Tanzania. However, the current empirical results are consistent with the previous results. Indeed, as per-capita income rises, expenditure shifts toward services and manufactured goods relative to agriculture. Schultz (1953) and Timmer (1988) also, show that as a country develops, returns to factors used in agricultural production decline, causing a net migration of labour and capital from agriculture sector to other sectors, thus reducing relative growth rates of agricultural output and employment. The coefficient of real per capita GDP in transportation, storage and communication is not significant.

Turning to gross fixed capital formation, empirical results show that the coefficient of gross fixed capital formation in manufacturing and mining is positive and statistically significant at 5 percent level, indicating that, ceteris paribus, a 1 percent increase in FDI-to-GDP ratio may lead, on average, to 0.12 percent and 0.36 percent increase in manufacturing value added-to-GDP ratio and mining value added-to-GDP ratio respectively. Surprisingly and contrary to expectations, gross fixed capital formation seems to have a negative effect on agriculture. The coefficient of gross fixed capital formation is negative and statistically significant at 10 percent level. This suggests that, other factors being equal, if gross fixed capital formation-to-GDP ratio increases by 1 percent, the ratio of agriculture valued added-to-GDP will decline by 0.06. Gross fixed capital formation, however, seems to exert no influence on transport, storage and communication over the period of study.

Labour as proxied by population growth seems to play a great role in agriculture sector in Tanzania. Over the 1970-2015 period, this factor has a positive and statistically significant coefficient in agricultural sector but statistically insignificant across all other sectors in consideration. Specifically, holding other factors constant, a 1 percent increase in rural population may, on average, lead to 4.1 percent increase agriculture valued added-to-GDP ratio. This may be due to the fact that agricultural production is labour intensive.

Trade policy also is one of the control variables that are hypothesized to influence sectoral performance. Empirical results suggest that the trade liberalization or trade openness is negatively related to the ratio of agricultural value added-to-GDP at 10 percent level. These results imply that the increased openness of the economy may have adversely affected agricultural. Trade liberalization also seems to have a negative effect on mining value added-to-GDP ratio. In fact, there are two possible channels through which the increase in the degree of openness may adversely affect agriculture sector. First, greater openness characterized by the removal of tariffs and subsidies results in increased costs of inputs which in turn lower levels of use and directly affects productivity (see for example Odhiambo, Nyangito & Nzuma, 2004). A second possible channel could be through increased importation of goods, including agricultural products. With the liberalization of the economy, it became easier to import goods to compete with local production. While this is expected to enhance competition and productivity in the long run, it may have adversely affected productivity in the short run (Odhiambo, Nyangito & Nzuma, 2004). Indeed, the liberalization of imports results in intense competition from imports that threatens to displace some of the products of small farmers from their own domestic market (Khor & Hormeku, 2006). This is because imports coming from developed countries are usually heavily subsidized, and thus their prices are artificially cheapened (Khor & Hormeku, 2006). Trade liberalization; however, seems to have a positive and statistically significant effect on transportation, storage and communications.

Unsurprisingly, inflation has a negative effect on manufacturing sector. These results are consistent with the view that uncertainty about price developments mainly influences growth via distortions in the allocation of resources and via discouraging the overall accumulation of physical capital, while high levels of inflation may discourage saving and investment leading to low real productivity and value added. The increase in the real exchange rate apparently exert a negative and significant effect on construction and mining sectors but it has no effect on agriculture, manufacturing and transport, storage and construction sectors during the sample period.

5. Conclusions and Policy Implications

This paper examines the sectoral economic impact of FDI in Tanzania. The paper uses time series data over the 1970-2015 period. The main question of interest is whether the FDI positively affects the agriculture value added, mining value added, manufacturing valued added, construction and transport, storage & communication valued added. The results suggest that FDI has positive and statistically significant effect on secondary sector: manufacturing and construction sectors. It also has positive effect on transportation, storage and communications. Clearly, much of the manufacturing competitiveness, construction and communications that Tanzania has achieved in the past few decades can be attributed to FDI that has provided much needed capital and technological know-how. The results are consistent with the previous studies. As for the primary sector such as agriculture and mining the results are either totally opposite or insignificant. Regarding the agriculture sector, there is an evidence of negative and significant effect of FDI on agriculture value added while there is no evidence of the effect of FDI on mining value added over the 1970-2015 period. However, despite the fact that these results are also pretty much consistent with the literature, these two sectors in which FDI does not have a discernable positive effect require further analytical examination. In fact, there could be many reasons, such as a lack of FDI into agriculture sector to generate a discernible economic impact. On the basis of the empirical results it concluded that the inflow of FDI is essential along with other variables for sectoral growth in the economy especially it is more useful in case of secondary sector. On the basis of findings of this paper, it is suggested that government should make a proper incentive package to attract foreign investors to cover capital deficiencies in industrial sector at particular. This paper also suggests further research in area especially knowing the lack of impact of FDI on mining sectors and negative impact of FDI on agriculture sector. It is also suggested that policy-makers should review the sectoral basis on how to enable FDI inflows to be more productive and beneficial for the economy.

Appendix

Autocorrelation and Partial autocorrelation

Dependent Variable: ΔLn(Agr)

	AC	PAC	Q-Stat	Prob
1	-0.004	-0.004	0.0008	0.977
2	0.020	0.020	0.0199	0.990
3	0.111	0.111	0.6144	0.893
4	0.088	0.089	0.9947	0.911
5	0.006	0.004	0.9966	0.963
6	-0.090	-0.108	1.4172	0.965
7	0.061	0.039	1.6150	0.978
8	0.025	0.023	1.6502	0.990
9	-0.057	-0.038	1.8324	0.994
10	-0.017	-0.015	1.8497	0.997
11	-0.089	-0.104	2.3248	0.997
12	-0.111	-0.121	3.0952	0.995
13	0.024	0.050	3.1334	0.997
14	-0.074	-0.041	3.5018	0.998
15	-0.058	-0.033	3.7327	0.998
16	-0.051	-0.039	3.9173	0.999
17	-0.008	-0.017	3.9225	1.000
18	-0.007	0.002	3.9265	1.000
19	-0.145	-0.109	5.6173	0.999
20	0.107	0.102	6.5859	0.998

Dependent Variable: ΔLn(Man)

	AC	PAC	Q-Stat	Prob
1	-0.079	-0.079	0.2901	0.590
2	0.143	0.137	1.2525	0.535
3	-0.143	-0.126	2.2481	0.523
4	-0.114	-0.156	2.8887	0.577
5	0.049	0.074	3.0099	0.698
6	-0.054	-0.028	3.1604	0.788
7	-0.083	-0.154	3.5271	0.832
8	-0.072	-0.079	3.8119	0.874
9	0.013	0.049	3.8218	0.923
10	-0.014	-0.044	3.8334	0.955
11	0.039	-0.028	3.9267	0.972
12	-0.024	-0.013	3.9618	0.984
13	0.009	0.002	3.9665	0.992
14	-0.082	-0.117	4.4173	0.992
15	-0.008	-0.042	4.4221	0.996
16	0.054	0.083	4.6279	0.997
17	-0.055	-0.080	4.8535	0.998
18	-0.016	-0.102	4.8733	0.999
19	0.043	0.100	5.0230	0.999
20	-0.094	-0.090	5.7619	0.999

Dependent Variable: ΔLn(Min)

	AC	PAC	Q-Stat	Prob
1	-0.071	-0.071	0.2312	0.631
2	-0.128	-0.133	0.9990	0.607
3	-0.044	-0.065	1.0923	0.779
4	0.247	0.227	4.1163	0.390
5	0.023	0.051	4.1444	0.529
6	-0.106	-0.051	4.7341	0.578
7	-0.259	-0.264	8.3279	0.305
8	-0.063	-0.207	8.5460	0.382
9	0.084	-0.019	8.9461	0.442
10	-0.059	-0.048	9.1535	0.518
11	0.092	0.267	9.6674	0.561
12	-0.058	0.064	9.8796	0.627
13	-0.025	-0.078	9.9211	0.700
14	-0.018	-0.175	9.9416	0.766
15	0.216	0.027	13.166	0.590
16	-0.175	-0.185	15.356	0.499
17	-0.078	-0.031	15.810	0.537
18	0.036	0.166	15.910	0.599
19	0.075	0.085	16.359	0.633
20	0.024	0.096	16.408	0.691

Dependent Variable: ΔLn(Con)

	AC	PAC	Q-Stat	Prob
1	-0.036	-0.036	0.0607	0.805
2	0.037	0.036	0.1267	0.939
3	-0.169	-0.167	1.5062	0.681
4	0.037	0.026	1.5742	0.813
5	-0.079	-0.068	1.8926	0.864
6	0.161	0.132	3.2531	0.776
7	-0.156	-0.144	4.5574	0.714
8	-0.001	-0.036	4.5574	0.804
9	0.077	0.141	4.8980	0.843
10	-0.058	-0.126	5.0975	0.885
11	0.189	0.233	7.2552	0.778
12	-0.052	-0.084	7.4225	0.828
13	-0.282	-0.320	12.538	0.484
14	-0.128	-0.034	13.632	0.477
15	-0.001	-0.098	13.632	0.554
16	0.070	0.117	13.981	0.600
17	0.028	-0.096	14.037	0.664
18	-0.061	-0.079	14.326	0.708
19	-0.154	-0.047	16.233	0.642
20	0.038	-0.145	16.353	0.694

Dependent Variable: ΔLn(TSC)

	AC	PAC	Q-Stat	Prob
1	-0.004	-0.004	0.0006	0.981
2	-0.061	-0.061	0.1748	0.916
3	0.044	0.044	0.2679	0.966
4	0.030	0.027	0.3131	0.989
5	-0.031	-0.025	0.3607	0.996
6	-0.060	-0.059	0.5510	0.997
7	-0.041	-0.048	0.6428	0.999
8	-0.096	-0.103	1.1557	0.997
9	-0.039	-0.040	1.2407	0.999
10	-0.207	-0.219	3.7556	0.958
11	-0.076	-0.088	4.1089	0.967
12	-0.020	-0.059	4.1328	0.981
13	-0.100	-0.121	4.7716	0.980
14	-0.157	-0.197	6.4082	0.955
15	0.057	-0.013	6.6346	0.967
16	-0.021	-0.119	6.6669	0.979
17	0.186	0.157	9.2430	0.932
18	0.049	-0.027	9.4287	0.949
19	-0.103	-0.159	10.290	0.945
20	0.135	0.030	11.812	0.922

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